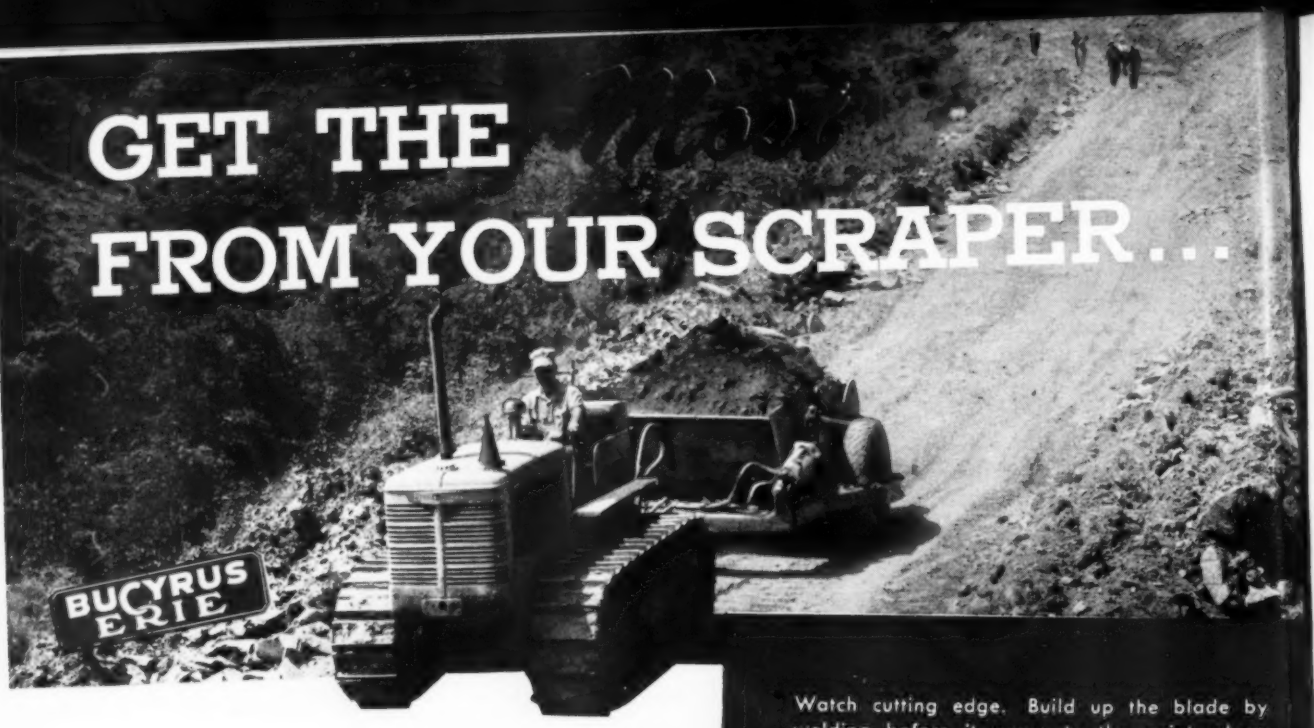
EXCAVATING ENGINEER

FOUNDED 1905

GET THE MOST FROM YOUR SCRAPER...



Your hydraulic scraper is not expendable — keep it in A1 shape. The successful completion of wartime production schedules rests on the ability of your present equipment to stand up to the gruelling task of round the clock operation. Here are some suggestions that may help eliminate breakdown time from your records.

- Watch cutting edge. Build up the blade by welding before it wears to the point where supporting casting is damaged.
- Keep leverage mechanism and pivot pins clean and in proper adjustment for freedom of action in bowl.
- Set apron opening at correct position for the type of soil which is being loaded.
- Make certain that same adjustment of bowl stop is used on both left and right sides to avoid twisting of bowl.
- Check condition of draw-bar pin and safety cable.
- Hydraulic system check-up should be regular routine. Make certain that oil is up to level and system is clear of air.
- Drain the oil when it is dirty. Floating particles wear the pump and valve.
- Keep all hose and pipe connections tight to prevent loss of oil and infiltration of air.
- Have an adequate schedule for lubricating at high-pressure fittings.
- See that all nuts, bolts and cotter pins are in place and tight. Keep tires properly inflated.

Bucyrus-Erie 4-wheel scrapers are built to withstand the grind of triple-shift performance, but even they must have proper maintenance for speedy production over long periods of time. Your International TracTracTor distributor will gladly advise you on proper maintenance and lubrication.

BUCYRUS ERIE TRACTOR EQUIPMENT

SEE YOUR INTERNATIONAL TracTracTor DISTRIBUTOR

KEEP A STRAIGHT FACE

Keep your quarry floors level...speed up the loading cycle of your shovels; increase your quarry production by removing the toe. This can be done quickly and economically with the Ingersoll-Rand FM-2 Wagon Drill.

The flexibility of this lightweight, 3-wheel mounting permits its use on all kinds of terrain. Holes can be drilled quickly at any angle—wherever you want them.

Long drill steels can be handled easily. Set-up time is reduced and the time spent in changing steels can be cut in half; hence more footage is drilled in a shift.

The X-71WD Drill used on the FM-2 has been developed especially for wagon drill service. Here's a machine that will withstand a terrific amount of punishment. Its piston has a long stroke and hits a heavy hammer blow—a blow which has unique follow-through characteristics that are so essential for deep-hole drilling. In addition, the drill has powerful rotation and will blow deep holes easily.

The combination of FM-2 flexibility and X-71WD drilling power will help you increase your quarry production. Try Jackbits too. They will speed up your drilling still more.

KEEP 'EM DRILLING

Ask your supplier for an oil that meets I-R Specification 433—the new rock drill lubricant developed by Ingersoll-Rand.

SOLVE YOUR DRILLING PROBLEMS WITH IR JACKBITS

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

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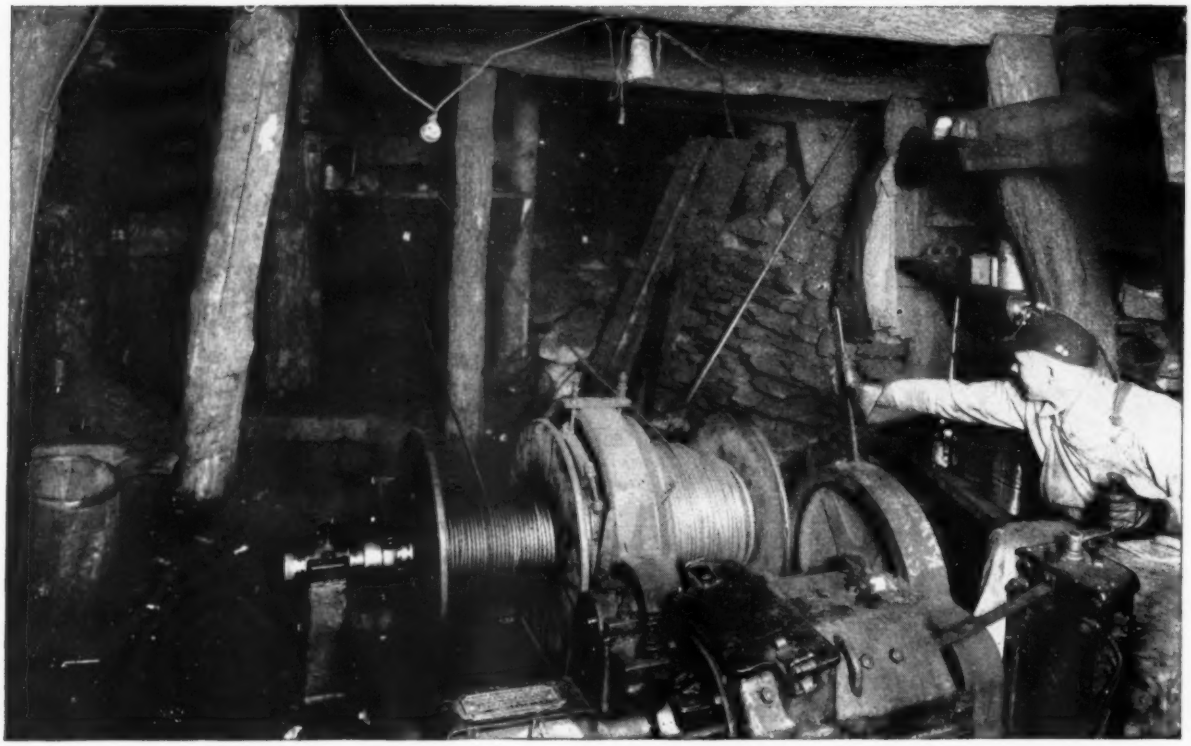


A WAR MESSAGE...

To The Man Behind The Throttle

Wartime calls for extra deftness in your throttle hand. Not only is it vital to the war effort to get more work out of your machine but at the same time do it with the least wear and tear.

Wire Rope especially must be given every possible care in order to last just as long as it possibly will. The chance of replacing wire rope is apt to continue limited. Great quantities of it still must be produced for our armed forces. As our offensive power gains momentum and invasions increase in number and scope, the greater becomes the tonnage of war materiel which must be hoisted, handled, loaded and unloaded all around the globe.

In the white heat of battle when lives depend upon it, wire rope must take abuse necessitating replacement long before its time. So it is that the important matter of conserving wire rope falls heavily on the throttle hand of users on the home front. To help you save wear and tear on your wire rope and keep it working, Union Wire Rope engineers have prepared and offer five different booklets entitled: *1. Correct Handling of Wire Rope. 2. Lubrication of Wire Rope. 3. Splicing Wire Rope. 4. Socketing Wire Rope.* These give you specialized information. *5. Rope Dope* amplifies on abuses of wire rope and the remedies. All are written in non-technical terms. Put into practice, the information contained in these booklets will help you contribute to the war effort now by conserving wire rope and it should stand you in good stead in safer and more satisfactory wire rope operation post-war. All are FREE for the asking. A penny post card request will bring any or all of the booklets.

FREE

CORRECT HANDLING OF WIRE ROPE | SOCKETING WIRE ROPE | SPLICING WIRE ROPE | WIRE ROPE LUBRICATION | ROPE DOPE

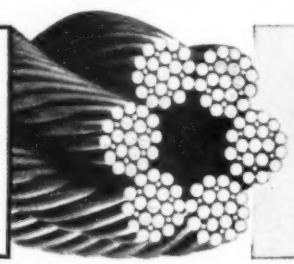
UNION WIRE ROPE CORPORATION, 2142 Manchester Ave., KANSAS CITY 3, MO.

Tulsa Houston Chicago Portland, Ore. Salt Lake City Ashland, Ky. New Orleans Atlanta Monahans, Texas

A-44

For Two Years of Team-work with Our Armed Forces

WHEN YOU NEED PREFORMED WIRE ROPE SPECIFY **union-formed**



union *Wire Rope*

"THE ULTIMATE IN LOW COST WIRE ROPE"

EXCAVATING ENGINEER

FOUNDED 1905

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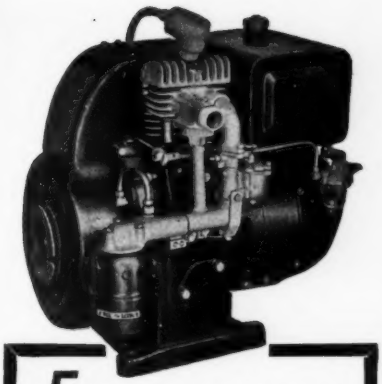

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★ ONAN GASOLINE DRIVEN ELECTRIC GENERATING PLANTS provide power and light for contracting and engineering projects, for all applications where electricity is not otherwise available, and for emergency service.

They're doing a war winning job on all the fighting fronts.

Sizes from 350 to 35,000 watts. 50 to 800 cycles, 110 to 660 volts, A.C.—6 to 4000 volts D.C. Also dual A.C. — D.C. output models.

Your inquiry regarding present or post war needs will receive prompt attention. D. W. ONAN & SONS, 1859 Royalston Ave., Minneapolis, Minn.

Awarded to each of the four Onan manufacturing plants.

ONAN
ELECTRIC PLANTS

1943 INDEX

For a copy of the Excavating Engineer Index for Vol. XXXVII, January through December, 1943, please send the coupon below.

THE EXCAVATING ENGINEER PUBLISHING CO.
SOUTH MILWAUKEE, WIS.

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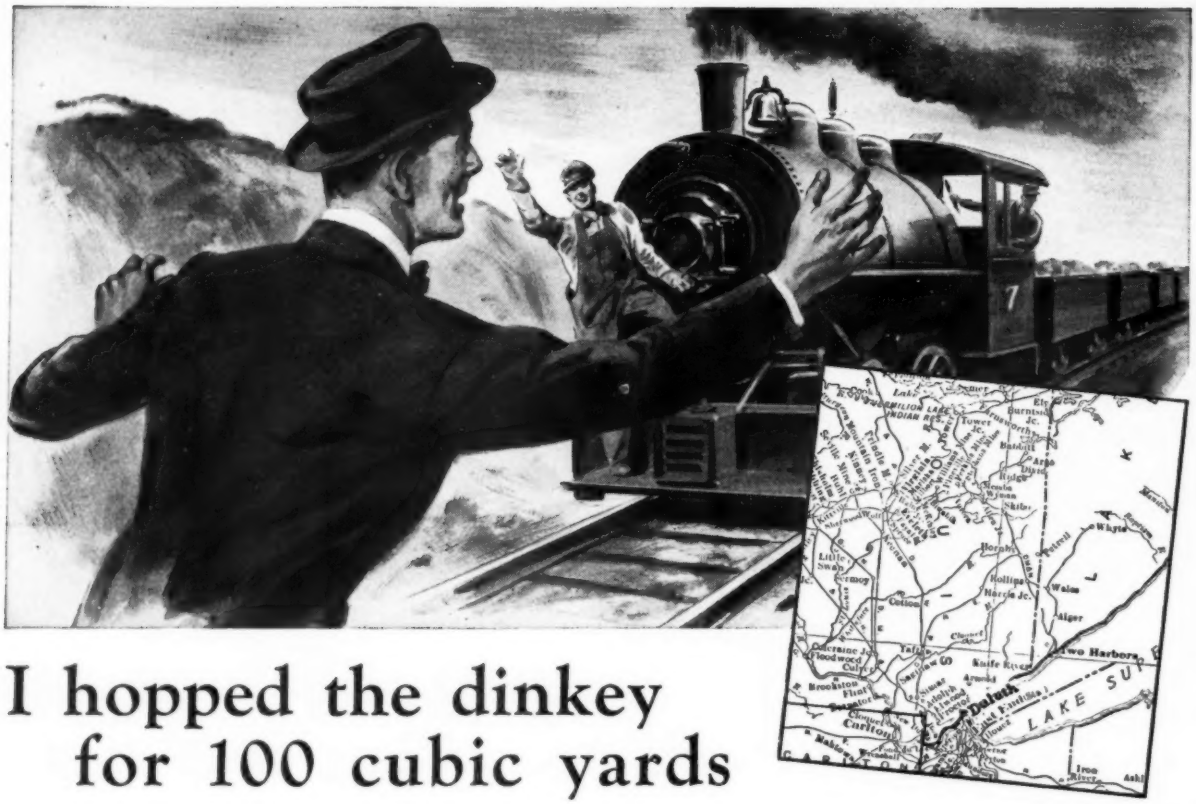


I hopped the dinkey for 100 cubic yards

"We'll ride the dinkey," said Smith, as he stepped on the track.

It was May, 1917. We had just entered the war, and everything was *rush*. Mines were hiring men and begging equipment. Cordeau was taking hold, and I was trying to cover mines and quarries in one-night stands. That morning, Smith and I were on the way to his iron pit.

Used three-inch wagon drill . . .

Hopping a dinkey engine is one trick I wouldn't try today. You straddled the rail, facing the locomotive as it came charging down. At the right moment you lifted your foot and landed on the front step, smack against the pilot — with the wind knocked out of you. If you missed . . .

We didn't miss. We hung on and rode the two miles to the pit — one of the prettiest layouts I'd ever seen. Smith was getting an excellent grade of iron ore, cutting back on benches and scooping it up with shovels alongside his narrow gauge right-of-way. He pointed ahead to where a whole section of track was covered with overburden of rock and earth, around which a gang was working with jack hammers.

"That's your big blast," he said, disgustedly. "Dumped a mountain of big rock on my railroad and set me back three days' production!"

"Got a blueprint?" I asked.

"Blueprint? Hell, no!" he snorted. "We just went ahead and sank our holes — fifty of 'em in two rows along the top. Used three-inch wagon drill about 25 feet deep and spaced 9 feet apart."

"How did you connect up?"

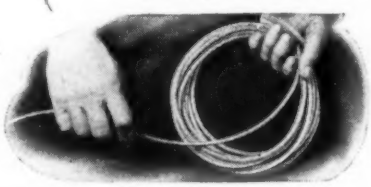
"We ran a line of Cordeau all along each row," said Smith, "and put an electric cap at the end of each line. Shot 'em simultaneously with a battery — and look at it!"

"Yes, — I see," I said. "We advocate *one* trunk line and *one* cap for a layout like this. Connect the Cordeau so as to shoot the front row *first*, and then the back row. Cordeau is plenty fast, but this interval gives time enough to shoot the front row a split second ahead of the back row, which relieves the burden and results in better fragmentation.

"Try Cordeau again with a *real* Cordeau hook-up and I think you'll make a lot of money."

That was a long time ago. His dinkey engine is somewhere in Mexico now, and he's hauling ore with Diesels on standard gauge. His pit looks like the Grand Canyon! And every yard since 1917 has been shot with our detonating fuse: Cordeau up to 1938, when he shifted to the new improved Primacord.

THE ENSIGN-BICKFORD COMPANY
Simsbury, Connecticut

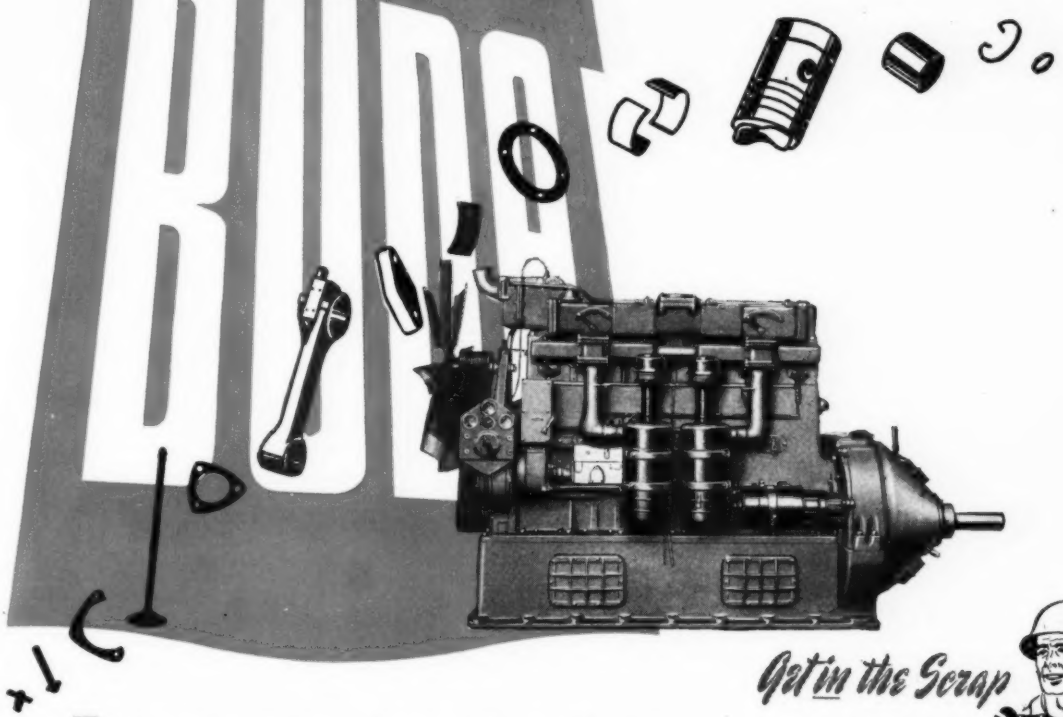


PRIMACORD·BICKFORD
Detonating Fuse
Also Makers of Ensign-Bickford Safety Fuse — since 1836

BATTLES are being won...

with engine parts you save through proper maintenance

BUDA



IN the last stages of the struggle for Victory it is more important than ever that engines be maintained at a high degree of operating efficiency. Give your BUDA Diesel proper care with definite periodic maintenance and help save critical materials for Victory equipment.

the BUDA Co.

HARVEY (Chicago Suburb) ILLINOIS

Get in the Scrap

. . . don't make it!

Every engine part you save means one more for the battlefront. Take care of your engine *regularly*—check your instruction book for details on lubrication and service.

ORDINARY DIESELS

. . . High cylinder pressures produce sledge-hammer blows that punish pistons, rods and crankshaft every power stroke.

BUDA Low-Pressure DIESELS

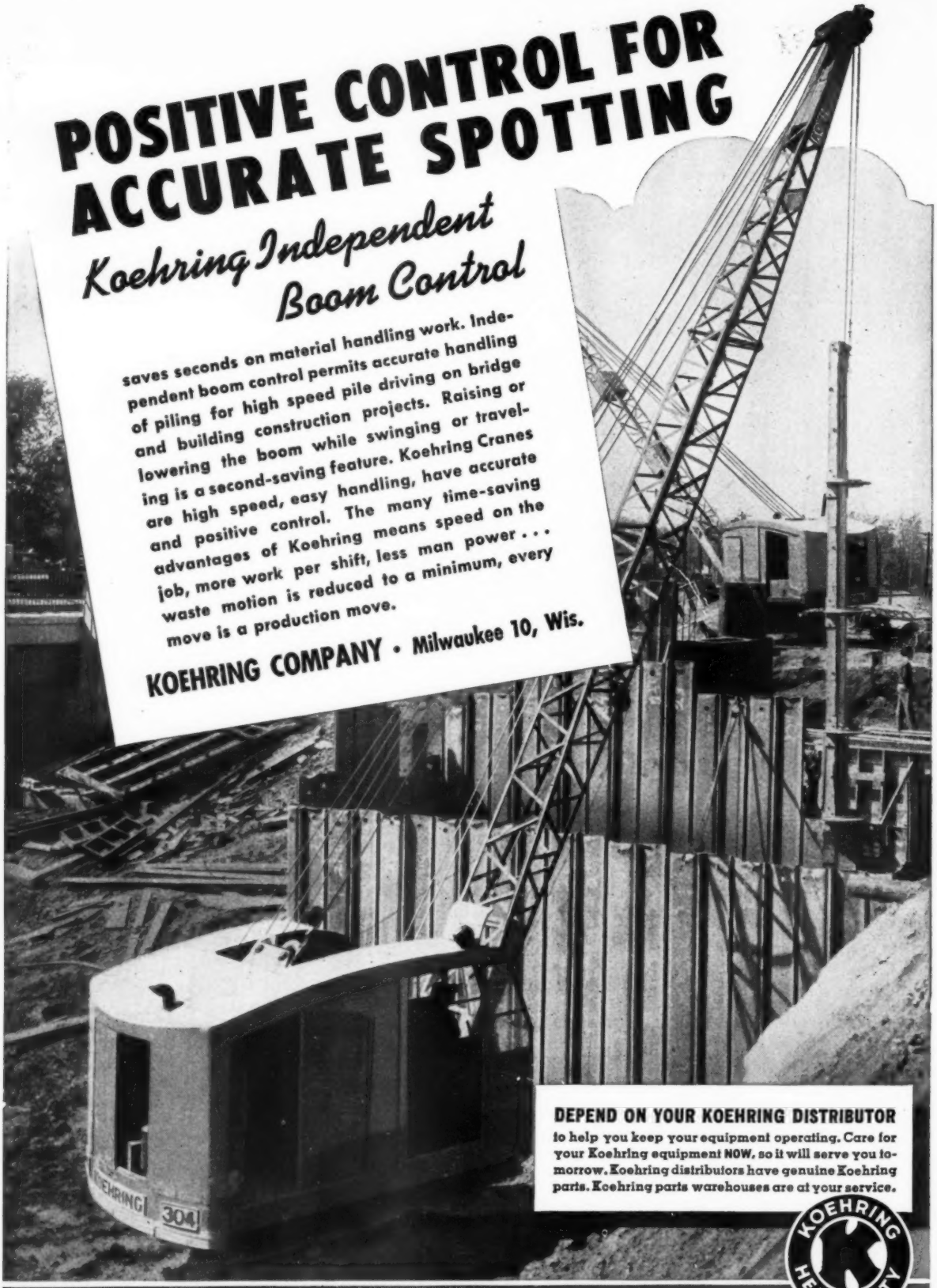
Prolonged "Low-pressure" combustion delivers a smooth, steady power stroke that cuts vibration saves parts.

POSITIVE CONTROL FOR ACCURATE SPOTTING

Koehring Independent Boom Control

saves seconds on material handling work. Independent boom control permits accurate handling of piling for high speed pile driving on bridge and building construction projects. Raising or lowering the boom while swinging or traveling is a second-saving feature. Koehring Cranes are high speed, easy handling, have accurate and positive control. The many time-saving advantages of Koehring means speed on the job, more work per shift, less man power . . . waste motion is reduced to a minimum, every move is a production move.

KOEHRING COMPANY • Milwaukee 10, Wis.

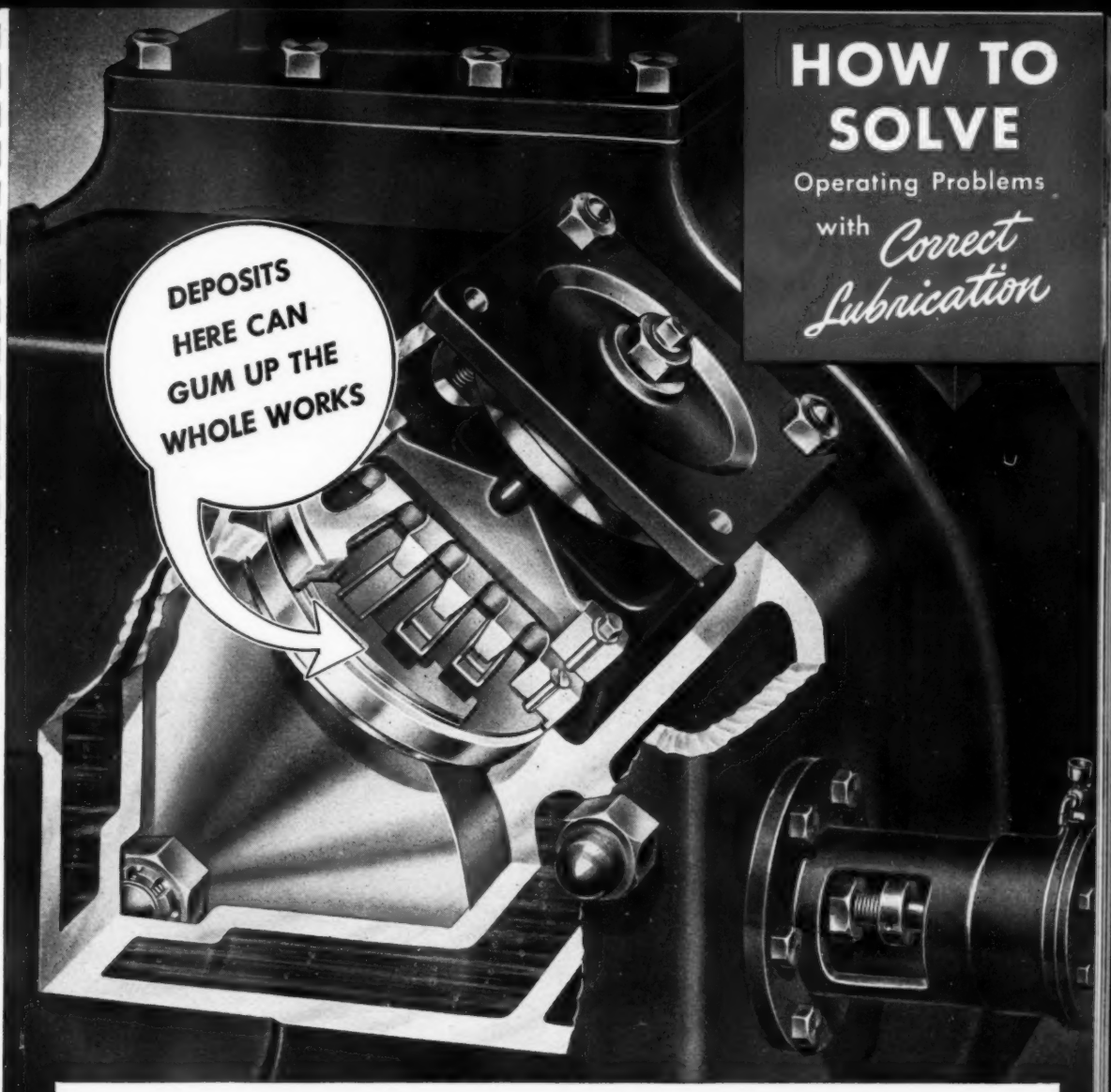


DEPEND ON YOUR KOEHRING DISTRIBUTOR
to help you keep your equipment operating. Care for your Koehring equipment NOW, so it will serve you tomorrow. Koehring distributors have genuine Koehring parts. Koehring parts warehouses are at your service.

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

ONE OF A SERIES OF SUGGESTIONS TO AID PRODUCTION



HOW TO SOLVE

Operating Problems with *Correct Lubrication*

Keep these valves clean!

THIS IS A "HOT SPOT"—and a danger spot—in air compressor operation. If oil oxidizes and forms carbon deposits here—in the valves—it can cause high discharge temperatures with dangerous consequences.

To prevent this, you need oils that have high chemical stability to resist oxidation. These oils must also have maximum lubricating value to lubricate pistons and cylinders efficiently.

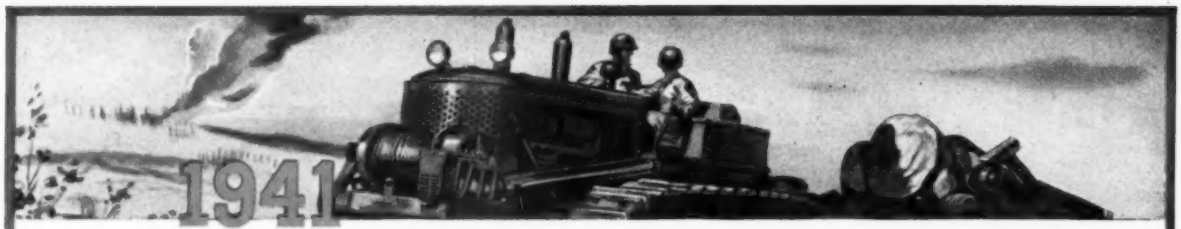
Gargoyle D.T.E. oils for compressors have the combined characteristics for this job. Their strong film protects pistons, cylinders, and valves from wear with minimum oil feeds—and these oils fight the formation of deposits to keep the valves clean.

Be sure you have these oils in your compressor for maximum efficiency with the lowest possible maintenance and lubrication costs.

GARGOYLE Lubricants

SOCONY-VACUUM OIL CO., INC., Standard Oil of N. Y. Div. • White Star Div. • Lubrite Div. • Chicago Div. • White Eagle Div. • Wadhams Div. • Magnolia Petroleum Company • General Petroleum Corporation of California.

CALL IN SOCONY-VACUUM



Nothing changed but the paint

EVERYTHING changed but the paint

LONG before Pearl Harbor your government called International Diesels to the nation's defense. Regulation olive-drab replaced the familiar red, and the big tractors of industry went to war. *Almost nothing was changed but the paint.*

These peacetime crawlers are writing war history in stirring action. They're pulling big guns, handling bombs for the Air Forces, smoothing shell-torn landing fields, clearing jungles, building roads. Tens of thousands of such International Tractors are valiantly supporting the Marines, the Navy, and the Army. Night and day we're building more. They're tops on every fighting front.

But that's not enough for American resourcefulness under the spur of war.

In 1943 a new "prime mover" rolled from the International assembly lines—a tractor in which *EVERYTHING was changed but the paint!*

Here's a revelation in crawler power, maneuverability and fighting quality . . . a high-speed performer under heavy load . . . a go-getter whose rugged construction and ease of handling will carry far beyond the Victory.

Victory is its one job, but there'll be a world to rebuild later. Then we'll build the International Diesel Crawlers you need. And you'll know why Harvester men are saying today: *"We've got a lot of things packed into this big baby that we'll use when the war is over!"*

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

BUY BONDS···BUY MORE BONDS

INTERNATIONAL HARVESTER

BACK OF EVERY ATTACK–

Preformed wire rope

A tiny torpedo boat races toward the enemy to deliver the kiss of death. A young skipper mans the wheel–and Preformed wire rope helps steer the craft over sub-infested waters.

The PT lets go its torpedoes. Then twists and dodges to keep out of enemy fire. And Preformed wire rope helps it get away.

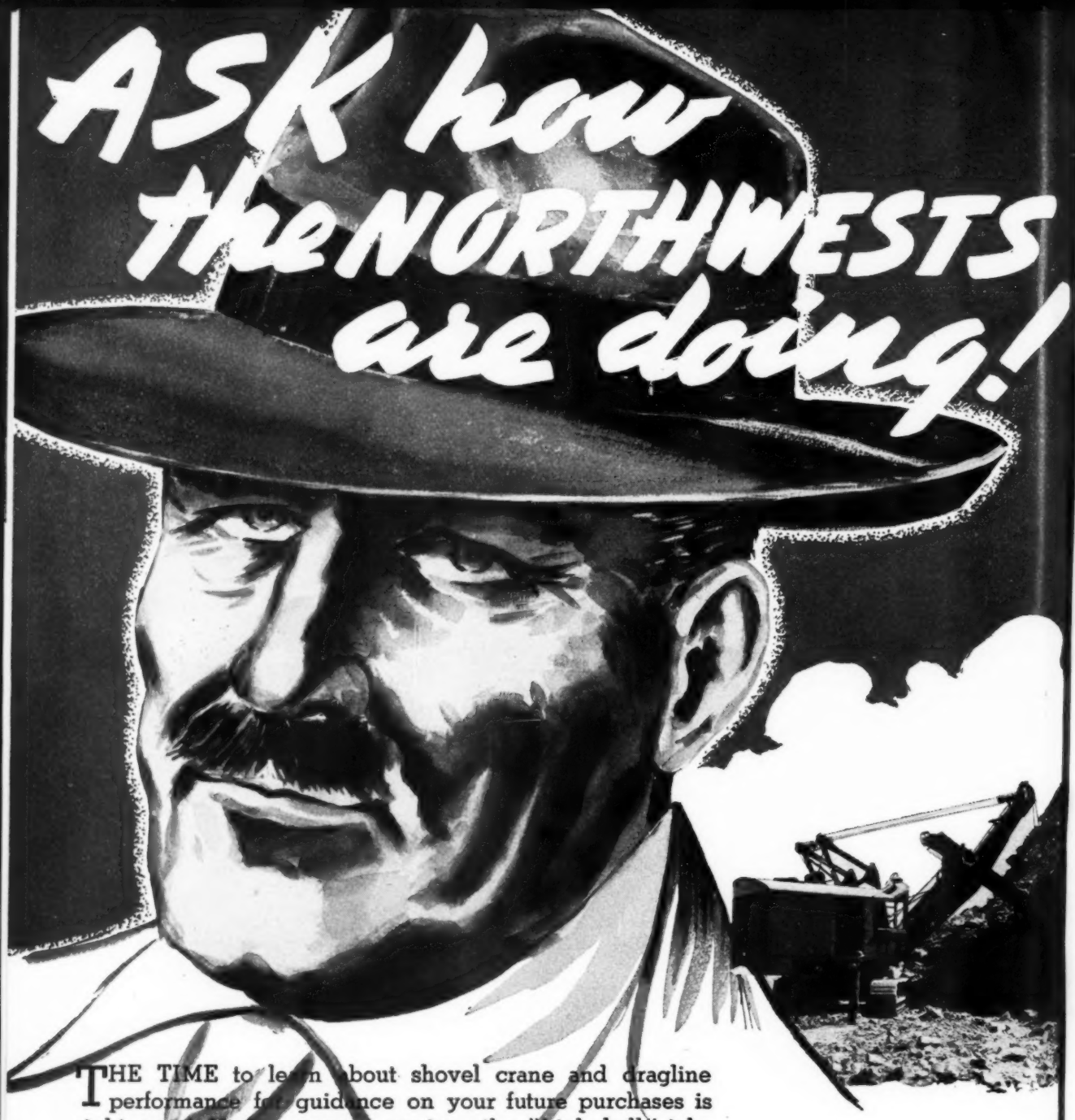
Where lives are at stake, Preformed has proved its superiority. That's why on PTs–it's Preformed.

Wherever the Allies attack, Preformed is on the job, proving its flexibility, its longer life–and its ability to save precious time.

That's why back of every attack–there's Preformed wire rope.

Ask your own wire rope manufacturer or supplier for Preformed wire rope

ASK how the NORTHWESTS are doing!



THE TIME to learn about shovel crane and dragline performance for guidance on your future purchases is right now! High pressure service—the "high ball" jobs of the war effort are a real test of equipment.

Ask how the Northwests are doing! You'll get an amazing story of trouble-free operation, low maintenance cost and dependability. More than ever before you'll learn the real reason why for years one out of every three Northwests has been a repeat order in the hands of leading contractors. Ask how Northwests are doing.

NORTHWEST ENGINEERING COMPANY

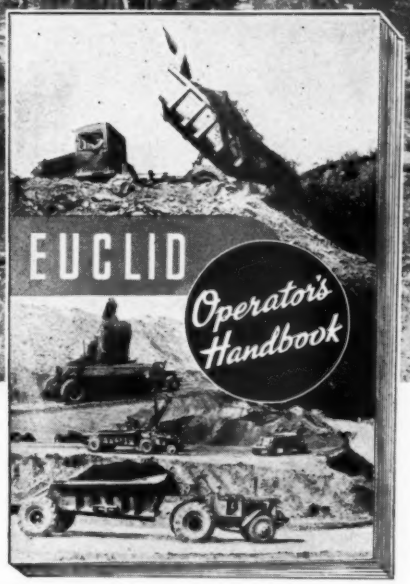
1750 Steger Building • 28 East Jackson Boulevard • Chicago 4, Illinois

-and when you have a real Rock Shovel you won't have to worry about output in dirt

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

"KNOW HOW" HELP FOR EUCLID OPERATORS



THIS CONVENIENT HANDBOOK for operators of Euclid equipment contains illustrations and information that will be of real help in preventing unnecessary breakdowns and resulting production delays. If you have not received a copy, your Euclid distributor or our factory Service Department will fill your request promptly.

● The new Euclid Operator's Handbook is a handy reference of complete data for proper care and efficient operation of both Rear-Dump and Bottom-Dump EUCLIDS. Its many charts and illustrations, as well as the easily understood suggestions and instructions provide "basic training" for new owners and operators.

Since most of the illustrative material and much of the information has not been available previously in other literature, the handbook will also be helpful to experienced operators of Euclid equipment. By making this "know how" information accessible to every Euclid operator, we hope to help keep your "Eucs" rolling longer.

The EUCLID ROAD MACHINERY Co. · · · Cleveland 17, Ohio

EUCLID SELF-POWERED HAULING EQUIPMENT For EARTH . . ROCK . . COAL . . ORE

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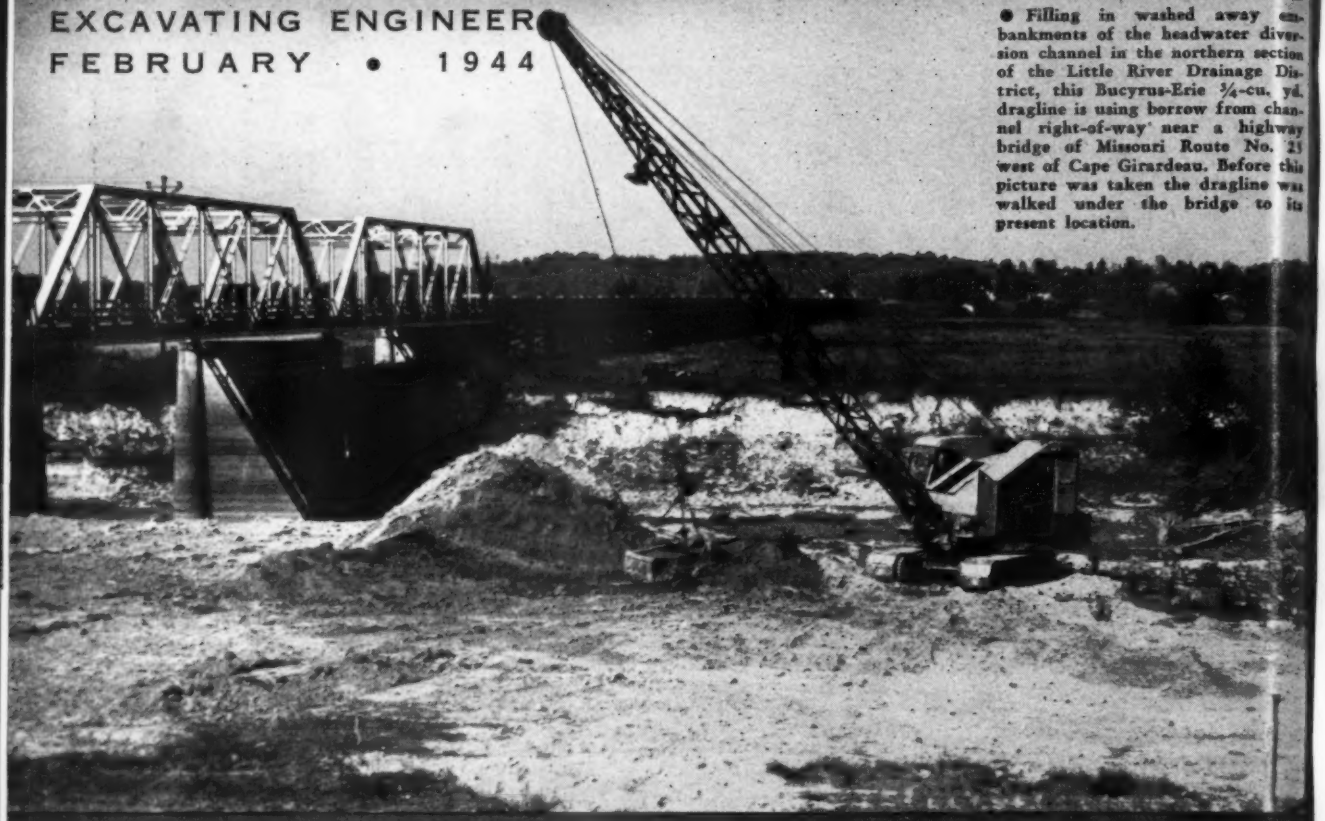
FEBRUARY • 1944



● Filling in washed away embankments of the headwater diversion channel in the northern section of the Little River Drainage District, this Bucyrus-Erie ¾-cu. yd. dragline is using borrow from channel right-of-way near a highway bridge of Missouri Route No. 25 west of Cape Girardeau. Before this picture was taken the dragline was walked under the bridge to its present location.

Little River Drainage District

Excavation of 81,530,650 cu. yds. of dirt converts 500,000 acres of forest and swamp land into rich agricultural country. District operates its own Bucyrus-Erie ¾ cu. yd. dragline for drainage maintenance work.

THROUGH the efforts of the Little River Drainage District, organized in 1907 and with headquarters in Cape Girardeau, Missouri, over 500,000 acres of forest and swamp land in seven counties in the state have been reclaimed and put into agricultural production. This area, roughly about 90 miles from its northern boundary at the foothills of the Ozark Mountains to Arkansas' northern boundary on the south, and with an average width of from 12 to 18 miles from east to west, is now a rich agricultural country with fertile soil producing huge crops of cotton, corn, potatoes, soy beans, grain and

● Left: A 35-ft. boom and 10-ft. extension gives the District's Bucyrus-Erie dragline a maximum cast of 55 feet as it fills in with borrow the embankment along the headwater diversion channel. Below: A view of Ditch No. 1 shortly after it had been cleaned by the District's dragline.

vegetables so vitally needed during the present war-time emergency.

Some of the land in this district, especially in the higher sections along the Sikeston Ridge in the northern section, can be traced back to original Spanish grants issued during the time Spain owned this territory before it was purchased by the United States as a part of the Louisiana Purchase. The valley land was not attractive to the earliest settlers, probably because of the frequent flood conditions existing previous to the improvements made by the Little River Drainage District.

Development of this land to its present stage of 90 per cent completion involved the excavation by the Little River Drainage District of 77,434,650 cubic yards of earth, plus 4,096,000 cubic yards of excavation and embankment moved under the supervision of the United States Engineer office of Memphis, Tennessee, in rebuilding the Headwater Diversion Levee. Most of this land had to be cleared of a thick growth of trees and underbrush, often growing on water-covered marsh land, before the ditching and levee work could be started.

The original plan of drainage of the district, carried through from 1914 to 1921, involved the excavation of 46,441,330 cubic yards; the West Extension, developed from 1921 to 1924, added 1,630,987 cubic yards of excavation; the Revised Plan, carried through from 1924 to 1928, meant the excavation of 20,957,771 cubic yards, and maintenance work from 1935 to September, 1943, added 8,404,650 cubic yards.

The Little River Drainage District is a statutory non-profit organization formed on a petition signed by a majority of land-owners in Bollinger, Cape Girardeau, Dunklin, New Madrid, Pemiscot, Scott and Stoddard counties of Missouri in 1907. After the district was organized it was surveyed and a drainage plan was prepared and submitted to the circuit court. The court appointed three commissioners to estimate the benefits and damages to the land. After the commissioners' appraisal was submitted to the court, the landowners were given a public hearing on their claims as to a justifiable benefit and damage figure. The court then gave a final decree and damages were paid landowners and benefit rates were set. It was decided in the beginning by the five-man board of commissions that governs the district, that the benefits assessed would not be more than $40 an acre or less than $4.00 an acre. The present rate of taxation is three per cent of the assessed benefit. The highest rate during the history of the district was 7.31 per cent.

Members of the five-man board of supervisors are elected for five-year terms, one man being elected each year. The landowners vote for supervisors according to the amount of land they own.

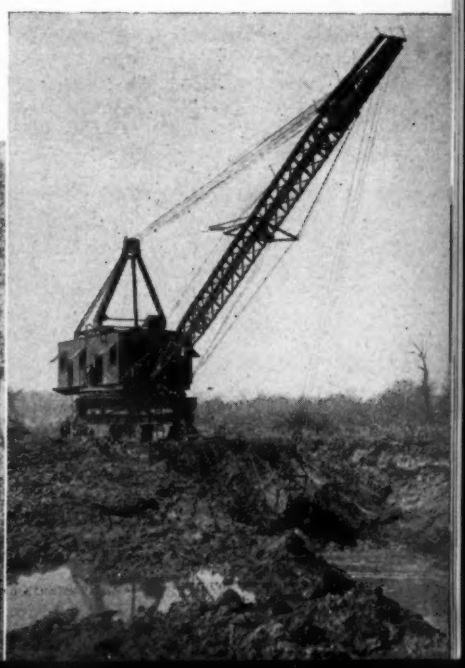
In 1912 about six per cent of the land in the district was cleared and under cultivation. All ditches were originally dug with a floating dredge. The district developed normally until the start of World War I and after the end of this war continued in development until in 1931 about 60 per cent of the acreage was cleared. There is now about 90 per cent of the land under cultivation, with the remaining 10 per cent in timber. This is probably the maximum development of the territory.

There are now a total of 899.26 miles of ditches and channels in the Little River Drainage District. The ditches vary from four to 121 feet in width at the base and have an average depth of 11 feet. There is one channel in the district, a diversion channel running east and west across the northern section, that has an average base width of 113 feet and an average depth of 14 feet.

There are also 283.20 levee miles in the district. These levees are located principally along the southern side of the east-west diversion channel and along the five main ditches that run parallel to each other in a southwesterly direction in the south central section and carry the water drained from the district through many feeder sub-ditches into Big Lake and then through the St. Francis River to the Mississippi River near Helena, Arkansas. There are no levees on the outside ditches, but levees were constructed on both sides of the second ditch from the west, 68 miles on one side and 50 miles on the other side. The next ditch, toward the east, has 40 miles of levee on one side and 12 miles on the other, and the next two ditches have 13 and 10½ miles, respectively on one side. The levees, which are all about the same size—70 feet at the base and 11 feet high—were constructed at the time the ditches were dug. The five ditches and the 200 to 250 feet between each cover a right of way of about one-quarter of a mile in width. Draglines were used to excavate the ditches and in places where there was more material than needed to construct the levees this excess material from the ditch excavations was spoiled.

The 45 miles of levee along the south edge of the diversion channel are from 110 to 120 feet wide at the

● Below: This is the swamp forest land that is now cleared and cultivated as a result of the Little River Drainage District's work of digging 899.26 miles of ditches and building 283.30 miles of levees. Right: The Floesch Construction Co. used this first electric dragline seen in the county, a Bucyrus, in 1915 to excavate a channel and construct a levee along the District headwater.



● A view of the headwater diversion channel looking east from Missouri State Highway 25.

base, 18 feet high, and have a 3½ to 1 to a 5 to 1 slope on the back side. The Little River Drainage District started the construction of this levee and had built it up to a 40-foot base when the job was taken over by the Federal government after a big flood in 1927 and the levee was then enlarged to its present size.

The diversion channel levee is the roof of the whole St. Francis basin in Missouri and Arkansas, an area larger than the State of Connecticut, in Southeast Missouri and Northeast Arkansas. It holds back water from the hills to the north and also the Mississippi River flood backwater. The levee's slopes are sodded and farmers in the territory are given pasture agreements. The Drainage district has charge of the maintenance of this levee.

Flood Control Basins

There are three flood control basins in the northern section of the district bounded on the south by the diversion channel levee which is about 16 feet high. The three basins, West, Middle, and East, are connected and control the water that comes down from the Ozark foothills, Castor River, White-water River, Crooked Creek, Hubble Creek and several smaller streams. The basins catch the water drained from an area of 1100 square miles. The water in the West Basin is controlled by a flexible mat in the channel until the water is emptied from the Middle and East Basins into the Mississippi River about five miles south of Cape Girardeau. At a maximum elevation of 365 the West Basin has a storage capacity of 5,014,000,000 cu. feet of water. The Middle Basin, which is really a valley between the other two basins, has a capacity of 1,894,733,460 cu. feet at a maximum elevation of 360 and the East Basin has a capacity of 418,200,000 cu. feet at its maximum elevation of 350. The basins were formed by the construction of the levee along the south side of the diversion channel. Maximum elevations occur in the Spring and Fall.

Flexible Mat Construction

The flexible mat between the West and Middle Basin is a 300-foot concrete revetment of wired concrete blocks in three separate mat formations that provide the flexibility. Galvanized wire cable, ⅜-inch diameter, was strung through the holes of regular 9x16-inch concrete building blocks to hold these blocks in a chain form, face to face, and also to hold the rows of blocks parallel to each other. One mat was placed over each bank of the connecting channel between the two basins and the third mat was laid across the bottom on the channel with its outside edges overlapping the two embankment mats. The bottom mat moves up or down as the embankment mats are forced apart by increased water flow washing out the banks.

The 300 feet of concrete block matting is followed by 1,000 feet of willow matting covered with rip-rap. The flexible mat and rip-rap control revetments installed in 1925 control and regulate the flow of water from the West Basin by preventing it from washing away the sides of the connecting channel between the basins.

There are two detention, or silt basins of 4,500 and 600 acres, respectively, in the northeast and north-central sections of the district. Two 30-inch concrete conduits regulate the flow of water from these basins to ditches that carry the water southward.

In 1935 cleaning out work of ditches

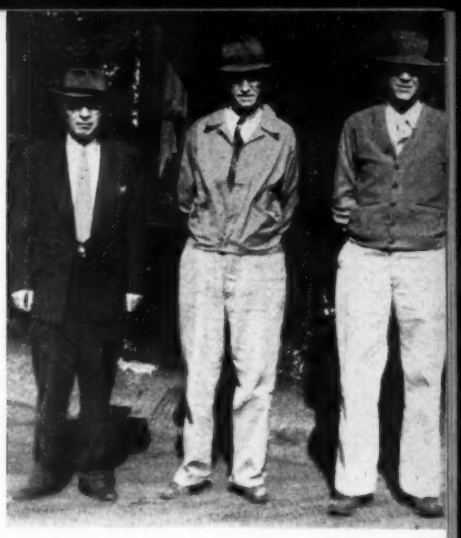
● General views of the flexible concrete mats of the West Basin control works of the headwater diversion channel. The picture to the left shows brush and weeds growing between the blocks and helping to anchor the embankment mats. The center picture indicates the method of wiring the concrete blocks together. The picture to the right shows how the mat across the bottom of the channel overlaps the two embankment mats to provide the flexibility. The willow matting covered with rip-rap, used as a secondary control measure, can be seen meeting the concrete block control system. The insert shows how the willow matting was formed.

OPERATING AND MAINTENANCE COST OF BUCYRUS-ERIE 22-B DRAGLINE OWNED BY LITTLE RIVER DRAINAGE DISTRICT

June, 1940, to Sept. 1, 1943

	No. Miles	Cu. Yds. Moved	Total Cost	Cost per Cu. Yd.
Depreciation Included	62.34	473,937	$35,543.75	$.0750
Without Depreciation	62.34	473,937	$28,926.84	$.0610
Fuel Cost	62.34	473,937	$ 6,741.58*	$.0142
Repairs	62.34	473,937	$ 4,186.09	$.0088
Labor Cost	62.34	473,937	$17,347.63	$.0367

*** Average cost of 52,512 gals. of gasoline estimated at 11.5c a gal. (including light plant and hauling truck); 2,352 qts. of oil at 19.7c qt., and 1,323 pounds of grease at 18.10c lb.**



● Left to right: B. F. Burns, secretary-treasurer of the Little River Drainage District; Earl R. Schultz, chief engineer, and T. G. Whitelaw, maintenance overseer.

was started on a large scale with the work being put out on contract. The average contract was for jobs involving 150,000 cu. yds. to 800,000 cu. yds. of excavation. Contractors used draglines with from ½ to 1½ cu. yd. buckets for this work. The draglines were usually kept busy 24 hours a day on a three-shift basis, dredging out about two or three feet of silt that collects in the bottom of the ditches, widening and straightening the ditches, and repairing cave-ins and washouts. From 1935 to 1942, 1,023,801 cu. yds. were excavated under contract at an average price of $.0559 per cu. yard.

When relatively small maintenance jobs had to be taken care of on various ditches all over the district it was unprofitable for contractors to move frequently from one ditch to another. It was decided by the Little River Drainage District to purchase and operate their own dragline for this "spot" maintenance work. A Bucyrus-Erie 22-B ¾-yd. dragline with a 35-foot boom and 10-foot extension was purchased and put to work in June, 1940. A 22-ton trailer with a 27′ 10″ overall length, with eight wheels in the rear and four in front was purchased from the C. R. Jahn Co. for hauling the dragline to various locations where maintenance work was needed. The trailer is pulled by one of the District's trucks.

The Bucyrus-Erie dragline has been kept working and moving from job to job constantly, 24 hours a day, since it was installed. During this time it has moved 473,937 cu. yds. from 62.34 miles of ditches. Earl R. Schultz, chief engineer, and T. G. Whitelaw, maintenance overseer, have kept complete maintenance cost and production records of the machine and report that the cost of moving the 473,937 cu. yds. of various earth, including sand, gumbo, clay and silt, was $28,926.84, or an average of $.0610 a yard, including salaries of three operators, two oilers, repairs, dynamiting stumps, moves, fuel, cable, etc. The three operators are paid straight monthly salaries and the two oilers work on an hourly basis. The operators are paid during shut-downs of the machine and work on eight-hour shifts. The two oilers each work 12-hour shifts.

The original cost of the dragline and trailer, $11,512.80, is being depreciated over a period of five years at the rate of $191.88 per month.

The depreciation cost to September 1, 1943, was $6,616.91 for the 473,937 cu. yds. moved, $.014 per cu. yd.

Labor Cost

Labor cost of operating the dragline for the same period has been $17,847.63 or $.0367 a cu. yd. There was one major repair job on the dragline during the period of its operation and it was given a general overhauling last summer. Total cost of repairs to date, including parts, cable, machine shop labor bills, etc., was $4,186.09, or less than one cent a cubic yard of material moved.

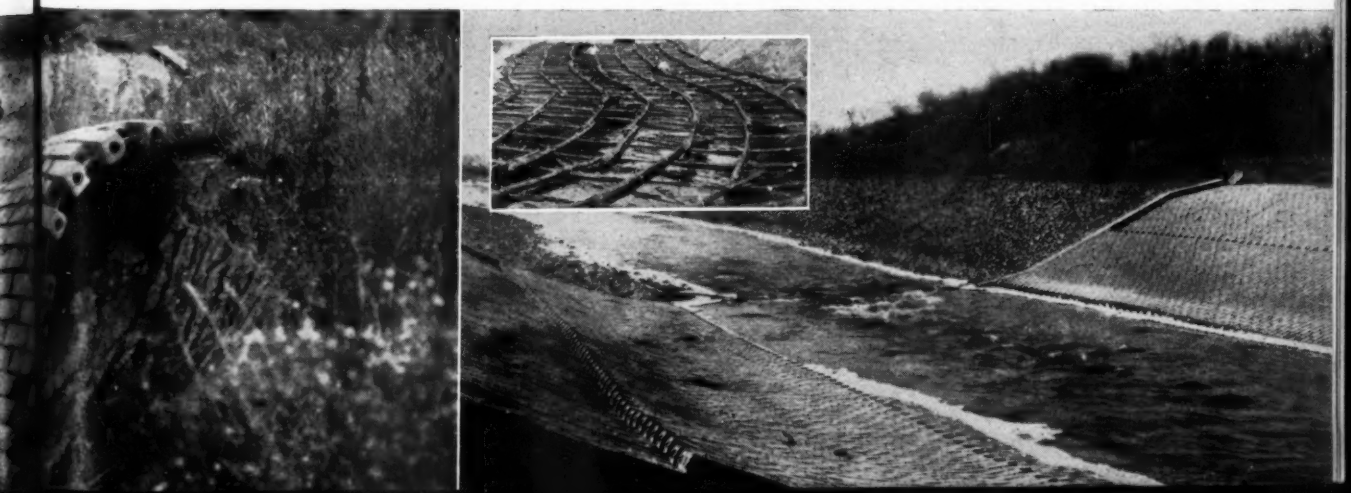
Fuel Consumption

Since its installation the Bucyrus-Erie dragline has used 52,512 gallons of gasoline, or a production figure of 9.03 cu. yards per gallon. The cost of gasoline averaged $.115 a gallon, bringing the cubic yard cost to $.0142 a cubic yard. There were 2,352 quarts of oil used at an average cost of 19.7c a quart and 1,323 pounds of grease at an average cost of $.1810 per pound.

Cost figures also include the operation of a Kohler 800W light plant used for night excavation. The plant, run by gasoline motor, is located in the cab of the machine. The lights are on the boom.

Higher costs due to the war had its effect on production cost figures. From June, 1940, to October, 1941, the Bucyrus-Erie excavated 200,225 cu. yds. over 33.45 miles at a cost of

(Continued on page 96)



Minimum Amount of Needed Construction on Main or Principal Highways as of July, 1943

(Prepared by the American Association of State Highway Officials)

STATE	Should Be Rebuilt		Should Be Widened		Should Be Re-located (Therefore Requiring New Construction)		Total Miles	Total Estimated Cost	Bridges to be Widened or Re-built		Estimated Grand Total Cost Roads and Bridges
	Miles	Estimated Cost	Miles	Estimated Cost	Miles	Estimated Cost			Number	Estimated Cost	
Alabama	153	3,825,000	1,165	29,125,000	527	21,080,000	1,845	54,030,000	346	3,502,000	57,532,000
Arizona	1,400	32,150,000	(1)	[1] 4,500,000	272	9,000,000	1,672	45,650,000	39	2,800,000	48,450,000
Arkansas	2,338	25,617,000	2,141	19,631,000	1,794	56,415,000	6,273	101,663,000	2,094	32,000,000	133,663,000
California	610	35,458,000	226	13,019,000	692	104,913,000	1,528	153,390,000	256	15,400,000	168,790,000
Colorado	930	10,314,000	1,489	30,785,000	675	34,521,000	3,094	75,620,000	89	2,884,000	78,504,000
Connecticut	192	10,400,000	367	15,500,000	577	195,300,000	1,136	221,200,000	46	22,100,000	243,300,000
Delaware	170	4,068,000	84	1,104,000	70	6,960,000	324	12,132,000	45	2,910,000	15,042,000
Florida	3,950	80,929,000	665	15,983,000	35	1,315,000	4,650	98,227,000	771	17,616,000	115,843,000
Georgia	977	29,310,000	1,154	17,310,000	360	38,808,000	2,491	85,428,000	200	7,500,000	92,928,000
Idaho	1,325	2,820,000	55	2,060,000	4,740	16,400,000	6,120	21,280,000	23	2,480,000	23,760,000
Illinois	904	57,075,000	309	30,165,000	679	63,310,000	1,892	150,550,000	212	32,605,000	183,155,000
Indiana	1,140	66,928,500	1180	31,984,300	830	27,791,200	3,150	126,704,000	160	34,157,000	160,861,000
Iowa	3,450	114,050,000	4,200	29,400,000	380	12,670,000	8,030	156,120,000	1,400	26,300,000	182,420,000
Kansas	4,122	79,142,000	442	11,091,000	1,707	56,507,000	6,271	146,740,000	1,363	30,710,000	177,450,000
Kentucky[2]	225	5,794,194	662	6,637,550	1,642	52,760,814	[4] 2,529	65,192,558	660	10,329,488	75,522,046
Louisiana	1,700	23,000,000	2,200	86,000,000	200	25,000,000	4,100	134,000,000	6,000	14,000,000	148,000,000
Maine	623	26,000,000	30	1,000,000	135	8,000,000	788	35,000,000	80	4,230,000	39,230,000
Maryland	238	9,055,500	56	2,008,000	464	52,510,500	758	63,574,000	66	22,572,000	86,146,000
Massachusetts	475	43,000,000	120	5,000,000	240	73,000,000	835	121,000,000	(14)	(14)	121,000,000
Michigan	1,688	92,498,000	200	8,000,000	1,214	233,675,000	3,102	334,173,000	68	5,836,000	340,009,000
Minnesota	3,500	127,575,000	900	12,059,000	1,600	58,280,000	6,000	197,914,000	547	15,414,000	213,328,000
Mississippi	250	5,738,500	68	1,705,000	1,035	63,135,000	1,353	70,578,500	157	6,700,000	77,278,500
Missouri	676	16,127,000	216	11,304,000	93	5,891,000	985	[13] 33,322,000	343	8,062,000	41,384,000
Montana [2]	2,000	50,600,000	630	9,500,000	160	6,000,000	2,790	66,100,000	152	7,500,000	73,600,000
Nebraska	5,666	49,650,000	56	2,500,000	184	3,800,000	5,906	55,950,000	800	10,500,000	66,450,000
Nevada	[5] 2,719	[5] 32,722,270	.....	.....	302	3,635,800	3,021	36,358,070	42	1,691,300	38,049,370
New Hampshire	380	15,200,000	.....	.....	68	6,700,000	448	21,900,000	17	1,930,000	23,830,000
New Jersey	103	20,685,500	250	52,960,500	235	73,260,000	588	146,906,000	490	46,684,000	193,590,000
New Mexico	459	10,506,430	2,738	42,724,660	558	17,266,680	3,755	70,497,770	1,336	15,500,060	85,997,830
New York	3,000	225,000,000	3,000	90,000,000	500	200,000,000	6,500	515,000,000	1,000	25,000,000	540,000,000
North Carolina	360	12,200,000	960	11,500,000	1,020	35,700,000	2,340	59,400,000	781	16,300,000	75,700,000
North Dakota	2,000	60,000,000	10	200,000	200	6,000,000	2,210	66,200,000	200	8,000,000	74,200,000
Ohio	1,500	105,000,000	10,107	303,200,000	400	91,500,000	12,007	499,700,000	[7] 4,704	80,300,000	580,000,000
Oklahoma	2,000	75,000,000	400	10,000,000	700	25,000,000	3,100	110,000,000	320	25,000,000	135,000,000
Oregon	1,190	22,000,000	304	7,000,000	2,306	108,000,000	3,800	137,000,000	500	13,000,000	150,000,000
Pennsylvania	2,024	242,988,000	427	29,393,000	338	136,623,000	2,789	409,004,000	[8] 133	[8] 40,764,000	449,768,000
Rhode Island	60	5,665,000	33	2,940,000	30	5,100,000	123	13,705,000	12	2,575,000	16,280,000
South Carolina	600	18,000,000	1,000	15,000,000	400	16,000,000	2,000	49,000,000	200	8,500,000	87,500,000
South Dakota [9]	3,990	50,670,000	239	1,022,000	413	6,232,000	4,642	57,924,000	688	3,666,000	61,590,000
Tennessee	500	25,000,000	1,220	13,000,000	1,150	100,000,000	2,870	138,000,000	[13] 824	[13] 12,000,000	[13] 150,000,000
Texas	9,000	450,000,000	4,000	120,000,000	4,000	160,000,000	17,000	730,000,000	600	100,000,000	830,000,000
Utah	825	28,100,000	325	8,000,000	450	12,500,000	1,600	48,600,000	125	5,500,000	54,100,000
Vermont	402	17,308,000	54	1,275,000	17	1,687,000	473	20,270,000	90	3,155,000	23,425,000
Virginia	701	20,490,000	1,272	32,865,000	1,545	50,636,000	3,518	103,991,000	439	6,762,000	110,753,000
Washington [10]	670	10,000,000	.....	.....	490	35,100,000	1,160	45,100,000	215	20,100,000	65,200,000
West Virginia	200	4,300,000	1,700	54,000,000	1,500	101,000,000	3,400	159,300,000	1,100	20,000,000	179,300,000
Wisconsin	[11] 3,000	[11] 140,000,000	.....	.....	.....	.....	3,000	140,000,000	255	13,000,000	153,000,000
Wyoming	[12] 500	[12] 15,000,000	.....	.....	.....	.....	500	15,000,000	50	1,500,000	16,500, 00
Totals and Averages	74,885	2,606,959,894	46,654	1,192,451,010	36,927	2,418,982,994	158,466	6,218,393,898	30,038	809,034,848	7,027,428,746

NOTES

1. Mileage not given. Urban areas only.
2. Montana states that it will take $8,000,000 to complete unimproved mileage.
3. Includes Trunk Line System.
4. 220 miles of the Trunk Line-System is adequate for 1950 traffic.
5. Includes widening.
6. Estimates based on pre-war construction costs — do not include engineering costs.
7. In addition, Ohio has 42,600 culverts and 425 railroad grade crossing separations, at an estimated cost of $100,000,000, which should be widened or rebuilt.
8. Includes grade crossing eliminations.
9. Estimates as to necessary construction and costs based on study made by the Highway Planning Survey and Public Roads Administration as of December 31, 1940. Standards were used to make these roads adequate for 1940 traffic volumes. It was also estimated that an additional $15,715,000 would be required to make these roads adequate for 1950 traffic volumes.
10. These figures include only the needed construction at this time on "main or principal" highways, and do not include any of the lesser important routes of the State and Federal Aid Systems.
11. Widening and major or minor relocation involved in practically all roads to be rebuilt.
12. Includes relocating and widening.
13. Does not include Mississippi River Bridge.
14. Included in road mileage and cost.
15. 22 miles at an estimated cost of $33,000,000 in the City of St. Louis.

Heavy War Toll

on country's roads and streets

Total cost of all needed improvements on state highway systems, not including new construction, amounts to over $7,000,000,000; other billions worth of work needed for county, township and village roads, city streets and for modernizing systems of metropolitan areas.

IT IS A COMMON FALLACY to consider postwar highway construction primarily as a cure for a possible period of unemployment after the war is ended. Providing jobs will be a logical result of postwar highway construction—if we build the roads we need there will be jobs, and when we construct needed facilities we will necessarily generate conditions that directly benefit business in general—but, the postwar highway construction program must primarily be based on the actual highway and economic needs of the country.

The urgent need for better and safer highways and streets constitutes one of the best outlets for equipment, material and manpower, extending well into the future. Because of the shortage of material and manpower during these war years the road and street systems are deteriorating at a greatly accelerated rate, and, as we all know, road and street construction is virtually non-existant today, and even maintenance operations are greatly curtailed. Meanwhile, the toll of weather is continuing and many roads of all classes must continue to bear in their present deteriorated condition the burden of heavily loaded trucks carrying war material.

Few probably realize to what extent the curtailment of highway construction expenditures are adding to the total amount already needed for construction on main roads and principal highways. The tabulation on the opposite page, prepared by the American Association of State Highway Officials, shows the seriousness of this situation. Highway systems of the 48 states total about 450,000 miles. As of July, 1943, the total mileage awaiting reconstruction, widening or relocation equals more than 158,000 miles. Bridges numbering in excess of 30,000 must be rebuilt, or widened. Total cost of all that work amounts to at least $7,000,000,000. This figure does not include new construction on a state system, such as of bridges where none exist, railroad bridge separations, express highways and bypass highways. Just to eliminate 5,000 of the 17,000 dangerous railroad crossings would cost in the neighborhood of $1,000,000,000. In addition to the state highway systems, there are 2,400,000,000 miles of county, township and village roads. These roads carry millions of children to school, much of the U. S. mail and also serve some 6,000,000 farms. In general, these highways are far from adequate. Less than two per cent of them have high type pavement, only about four per cent have a low-type bituminous surface, nearly one-third of them have a non-treated surface and are subject to dust and mud, and about a fourth of these local roads have been merely graded and drained. The other third can be classified as primitive.

Obviously, most local roads do not carry traffic enough to warrant first class construction, yet there are several hundred thousand miles which should be given treatment of some kind, light surfaced, or paved.

Because of the concentrated volume of traffic in cities, the street systems take a terrific punishment, and in general they are far from adequate. Of the 250,000 miles of city streets—about eight per cent of the total highway mileage carrying about 30 per cent of all traffic—only 95,000 miles have been paved, about 110,000 miles have a low-type surface, and about 45,000 miles have been provided only with grading and drainage. In addition to re-construction and surfacing of existing highways and streets, there is a very urgent need for construction of modern facilities. Scarcely a start has been made in meeting the need of metropolitan areas. Costly delays, wasted fuel, and high accident rates can be reduced only through construction of express highways, non-stop arteries, off-street parking facilities, belt-line highways to bypass traffic around built-up areas, bridges, grade separations over railroads and over other busy highways, and viaducts which are so urgently needed in many localities.

The American Road Builders' Association estimates that the annual expenditures for postwar years to meet the minimum needs for road construction are as follows: State highway system, which includes the Federal Aid System for the roads with U. S. route numbers, $1,100,000,000; county, township, and local roads, $400,000,000, and city streets and metropolitan area highways, $600,000,000.

The entire economic structure of this nation is actually built around the highway. Every business and every individual is dependent in many ways upon the motor vehicle. Even in these days of rationing, the truck, bus, and passenger car are performing functions which otherwise could not be accomplished. In normal times a very large percentage of our working population depends upon highway transportation for a livelihood. In 1941, some 7,000,000 people, or about 14 per cent of all workers, had jobs because of highway transportation. Highway transportation cannot exist without good highways.

Having ready for contract full plans and specifications for the sorely needed highway and road program so that work can be started immediately following peace-day will preserve the freedom of enterprise, an essential characteristic of the American way of life. The preliminary work of the post-war highway program must be done now—it will be too late to prevent improvised relief work if we wait until the war is over.

Reprints Available

Reprints of a series of EXCAVATING ENGINEER articles giving a state-by-state report on Post-war Highway Planning are available in a limited quantity. For a copy of this reprint, write The Excavating Engineer Publishing Company, South Milwaukee, Wisconsin.

Excavating Equipment
Goes to War!

• Combat engineers use a Quick-way dragline to fill a bomb crater alongside a railroad track in Italy. Rails will be jacked straight.

• Soldier in foreground is using a LeRoi air compressor for rock drilling while those in background are loading gelignite charges into drilled holes for blasting in the construction of a new road in New Guinea.

Official U. S. Navy Photo (other pictures are offi

• Caterpillar D7 tractor with LeTourneau bulldozer filling crater left by 500-lb. bomb dropped on North African airfield. Plane in background was the target but received no damage.

• Ammunition loaded to a sled from a LCM boat in Australia is pulled to a depot by this Bucyrus-Erie bulldozer-equipped tractor.

• Wire mats are laid down on this South Pacific island shore so that heavy equipment used in establishing the beach head will not bog down in the land.

(U. S. Army Signal Corps Photos)

• Ship pulling up to dock and others in the harbor will land men and equipment on this Italian beach. Note how the beach has been prepared by the LeTourneau (left) and LaPlant-Choate bulldozers to receive the landing.

LSTs from a Pr

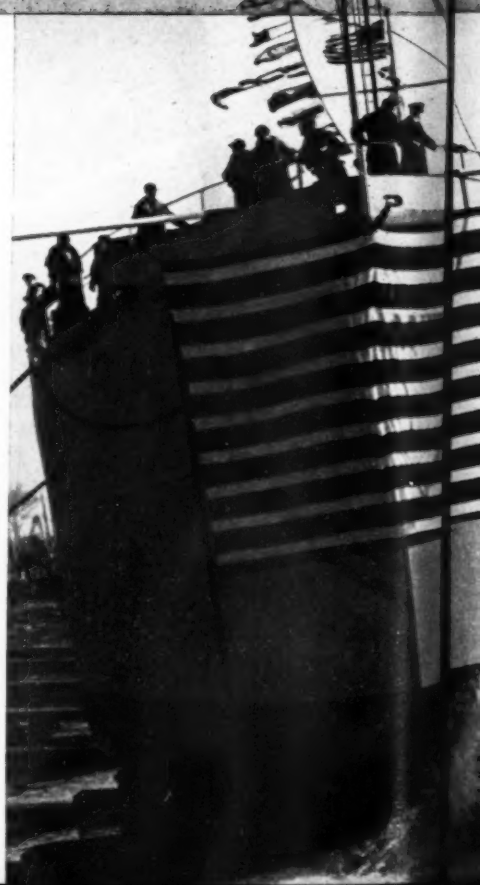
Crawler cranes are used exclusively by Chicago Bridge and Iron Company in assembling ocean-going tank-invasion ships in a Middle-western shipyard 1,000 miles from the nearest ocean.

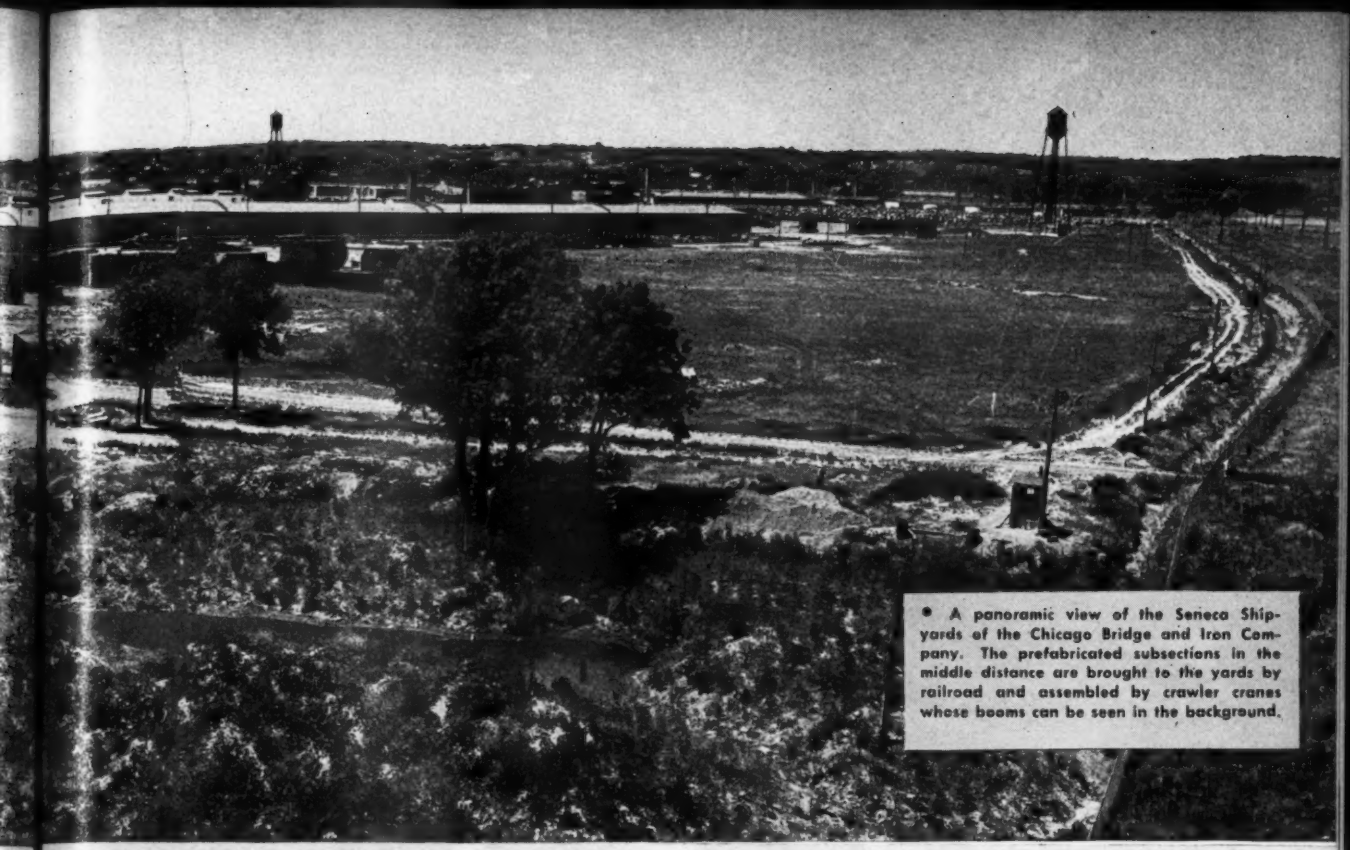
THE CHICAGO BRIDGE and Iron Company of Chicago, Ill., is building and launching ships that carry American invasion forces to Axis-held beaches throughout the world in a shipyard located in the heart of the Middlewestern prairie region a thousand miles from the nearest ocean.

In addition to its location, there are several other unusual features about this shipyard located on the banks of the Illinois River at Seneca, Ill. The Seneca shipyard is probably the only one in the world that uses crawler cranes exclusively for transporting and hoisting into place on the ships all material, machinery, and prefabricated sections, including the huge prefabricated bow and stern sections. There is a complete absence of whirly and huge gantry cranes common in other shipyards. Eighteen crawler cranes, seven Manitowocs, five Northwests, four Bucyrus-Eries and two Marions with lifting capacities of from 5 to 50 tons are used. The various cranes are used from time to time on all of the jobs at the yard. None of the cranes have specific single tasks.

The ships built at Seneca, LSTs (Landing Ships—Tanks), are constructed on assembly line methods and are launched sideways. For the welding and other assembly work light scaffolding brackets are attached to the side of the ships and there is no extensive timber scaffolding usually used in shipyards. As the ships are moved from original berth to center berth to launching ways there is no need for tearing down and putting up new scaffolding.

Construction of the Chicago Bridge and Iron Company's shipyard at the





• A panoramic view of the Seneca Shipyards of the Chicago Bridge and Iron Company. The prefabricated subsections in the middle distance are brought to the yards by railroad and assembled by crawler cranes whose booms can be seen in the background.

rairie Shipyard

• Hitting the water this LST will soon be ready to hit the Axis. After its launching the LST is tied to a fitting dock for final adjustments, tests and last minute fittings before she is taken to sea.

former pasture site at Seneca was started with grading operations six months after war was declared. The great need for these ships at the time is indicated by the fact that the first LSTs were started at the same time as the yard. Work on these ships was carried on with portable field equipment until the yard facilities were completed. The first ship was launched at Seneca on December 13, 1942, just six months after the construction of the yard was started. Since the time of the first launching other LSTs have come off the ways at Seneca with regularity and decreasing intervals between ships until now a new ship is launched every few days.

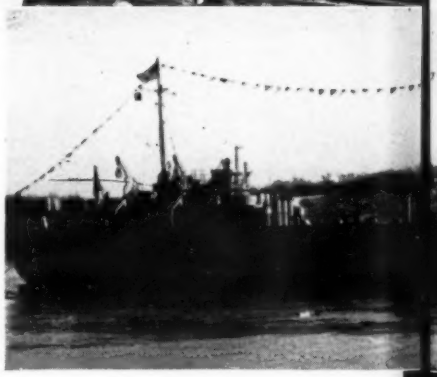
The yard covers approximately 200 acres of land. It is laid out with three rows of berths parallel to and extending back from the river. The farthest berth from the river is over 1800 feet from the water. The berths in the outside rows are staggered so that all of the ships can be moved end-wise to the center row of berths without interference. The single launching way is located at the river end of the center row of berths.

Sixteen to 20 steel transfer carriages (little cars) equipped with hydraulic jacks and pressure gauges for load equalization, are used for both the end-wise and side-wise moves of the LSTs. These transfer carriages travel on railroad rails.

The LST ships are 327 feet long and have a 50-foot beam. There are approximately 5.7 miles of piping and 8.5 miles of electric wiring in each of the ships. From the keel to the main deck they are about 28 feet high. Motive power is furnished by twin 1000 h.p. diesel engines and the power plant consists of three diesel generators. There are over 100 motors on each ship.

There are about 30,000 parts to a ship. The largest single section is the shaped stern end which weighs 50,000 pounds and fabricated upside down for down welding on the ground before being turned over and hoisted by crane into position. Three cranes are used for this operation. The various sections of the ships are sub-assembled into box-like sections at the Chicago Bridge and Iron Company's

● Absence of overhead cranes and maze of scaffolding makes the Seneca Shipyard unique. Keels are laid on berths like the one in the foreground. LSTs can be seen in various stages of completion on the several berths in this general picture of the shipyard. The LSTs are assembled on two outer rows of berths, moved to a center row and toward the launching way at the river.



● Above: Laying a keel. Above right: Ship on the launching cradle. The launching sleds are triangular-shaped to conform to the 10 to 1 slope of the launching way with its seven skids. Below right: Floating in the river after launching this LST will be tied to a fitting dock for final preparations for its voyage to sea. Launching sleds like the one in the middle foreground are brought back to shore for re-use by a pick-up tug.

shops at Birmingham, Ala., Greenville, Pa., and Chicago, Ill., and shipped to Seneca. These box-like sections are welded plates of steel.

After the box-like steel sections of the ships arrive at Seneca they are unloaded from railroad flat cars to Athey trailers by crawler crane. The loaded Athey trailers are hauled by Caterpillar diesel tractors to the ship berths where the sections are unloaded by other crawler cranes. Ten tractors are used for hauling. Other than the 50-ton stern section and the 27-ton upper portion of the bow, the heaviest other section of the ship is 15.5 tons.

As the ship assembly progresses, the hull is moved from the original berth to the center berth on the transfer carriages. Each carriage is equipped with four 30-ton hydraulic jacks that are operated from a single pump, so that each carriage is capable of raising and carrying a load of 120 tons. To move the ships successively from one berth to another, the carriages are rolled under the ship and the jacks raise it from the blocking. It is then moved to its new position where the jacks lower it to the blocking and the carriages are then removed. Winch trucks are used to pull the ships on the carriages from one berth to another by cables attached to temporary lugs on the sides of the ship. Endwise moves of the ships from the outside to the center row of the berths are accomplished in a similar manner. Sixteen carriages are used for endwise moves.

About 8,500 shipworkers are grouped into crews and each crew is assigned a specific task on each ship. The task usually takes about a week to finish on each ship. Work of assembling the ships at Seneca is carried on around the clock on two nine and one-half hour shifts with time for maintenance between shifts.

The height of the outside sections of each ship consists of three of these box-like sections, the inside of which becomes three decks of crew quarters, storage rooms, engine rooms, etc. The inside section of the ship

● Right: George T. Horton, president of the company. Extreme right: C. W. Hines, general manager of the shipbuilding division of Chicago Bridge and Iron Company.

consists of the hold in two sections. For unloading the ship's cargo the two doors comprising the bow of the ship are swung open, a steel ramp is lowered and the cargo discharged from the third deck. After the third, or lowest, deck is emptied the cargo on the main deck is lowered to the third deck of the ship by an elevator and then out through the bow doors and down the ramp. The second deck, around the outside of the ship, is used for crew's quarters.

The various box-like sections of the ships are hoisted into position by crawler cranes and then are welded to the adjoining sections. The entire ship is assembled by welding. No rivets are used. The fittings are also hoisted to the ships by crawler cranes.

At the river end of the center aisle of berths, the nearly completed ship is shifted to the launching sleds and the carriages are withdrawn. The launching cradle is triangular-shaped to conform with the 1 to 10 slope of the launching ways with its seven skids, holding the ship in vertical position until it hits the water. The ship is launched by simultaneously cutting 2½-inch diameter fiber lines releasing triggers that hold it in position at the top of the skids. The cradles and skids are greased before each launching and after the ship is launched a tug boat is used to recover the cradles from the water. The special maritime grease is re-used for successive launchings. The out-shore end of the ways is eight feet below normal water level. During launching ships are travelling about 25 miles per hour when they reach the water. It takes approximately 15 seconds for the ships to travel the length of the ways.

After the LSTs are launched they are tied to a fitting dock where final adjustments and tests are made and last minute equipment is installed. The Navy work crew takes over the ship after the launching and after the ship fittings are completed the armed guard crew arrives from training camp and boards her. The ferry crew takes the ship to the ocean.

The LSTs are armed with anti-aircraft guns. Because of their relatively flat-bottom and shallow draft, these combat ships are practically free of any danger from torpedoes.

The LSTs were originally designed to do a particular job, to carry heavy tanks for the Army. At a recent launching of one of the LSTs at Seneca, Rear Admiral E. L. Cochrane told the shipyard workers that the particular job for which they were originally designed is about the only job the LSTs have not been called upon to do, for the Army decided not to put these heavy tanks into production. Instead, the LSTs have been put to every other use, such as transporting automotive equipment, light and medium tanks, men, material — and for the evacuation of the wounded and moving up of medical supplies.

Mr. George T. Horton is president of the Chicago Bridge and Iron Company. Merle J. Trees is executive vice-president, Charles S. Pillsbury is vice-president and C. W. Hines is general manager of the shipbuilding division. Donald A. Leach is yard manager at Seneca. Captain W. R. Dowd, U.S.N., is supervisor of the shipbuilding for the Ninth Naval District. Lt. C. A. Dalton, U.S.N., is assistant supervisor of ships stationed at Seneca.

● Swinging the ramp, fabricated into one piece, into position. There are about 30,000 parts to a ship. The largest single section is the shaped stern end weighing 50,000 pounds.

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(Above) You get big loads like this in 60 to 90 seconds, with a Super C.

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(Below) Tournapull Convoy travelling over 8 feet of ice and 5 feet of snow on Mackenzie River enroute to Canol Pipe Line Project. Driving Tournapulls overland saves time and money . . . releases flat cars for other freight. On Canol Project, with temperatures as low as 55° below zero, 12 of these units were used to build roads and move gravel for surfacing on hauls up to a mile one-way. Tournapulls are moving earth faster in all war theatres. Over 500 are in use now by the Armed Forces. Large pneumatic tires provide traction and speed . . . allow travel over concrete and paved surfaces.

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Shots from the FIRING LINE

Approve Agreements for Outside Engineering

A help to state highway departments for carrying to contract stage their postwar highway construction plans, in spite of lack of engineering personnel, is the recent approval of the Public Roads Administration of three types of agreements that can be made by state highway departments for employment of outside engineering organizations. The three types are: An agreement providing for a definite and reasonable fee for engineering services; an agreement providing for specific rates of pay for each class of employee used on the work with a maximum total cost specified, and an agreement for payment of actual salaries and cost of materials, plus a definite and reasonable fee for direction.

Look for Postwar Stability in Nonmetallic Materials

If the United States avoids a postwar depression, the nonmetallic building material industry may enjoy "reasonable stability" when peace returns, the Bureau of Mines forecast today in a new publication, "Trends in Consumption and Prices of Building Materials."

Announcing that the production of cement, crushed stone, sand and gravel, building stone, roofing slate, building lime, and gypsum represented a business exceeding $612,000,000 (f.o.b. quarry or mill) in 1942, the Bureau reported: that cement, crushed stone, and sand and gravel reached new production levels in 1942, with cement topping the list in value—$286,905,197. The report also traces the domestic production of the nonmetallic building materials from 1910 to 1942, inclusive, and shows the total value for each commodity, its average cost per ton (f.o.b. quarry or mill), price index, net imports, and apparent consumption.

Several of the commodities had lower f.o.b. values at the quarry or mill in 1942 than in 1918, the Bureau's survey shows. Following is a comparison:

	1918	1942
Cement	$1.59 bbl.	$1.53
Crushed stone	.95 ton	.93
Sand and gravel	.61 ton	.62
Building stone	.87 cu. ft.	.92
Roofing slate	5.84 per sq.	8.87
Building lime	8.51 per ton	8.85
Gypsum	1.86 per ton	1.45

25th Annual AGC Meeting February 7-9 in Chicago

The 25th annual meeting of The Associated General Contractors of America will be held February 7-9, 1944, at the Drake Hotel, Chicago, Illinois. Due to the war, a meeting will be held of the Governing and Advisory Boards, attended also by chapter presidents and secretaries, rather than a convention of the full membership.

The present governing and advisory boards will meet February 7 and 8, and the boards composed of newly elected members will meet on February 9. The meetings will be open to the public. Meetings of the executive committee and the AGC secretaries' council will be held Sunday, February 6.

President Suggests 34,000-Mile Interregional Highway

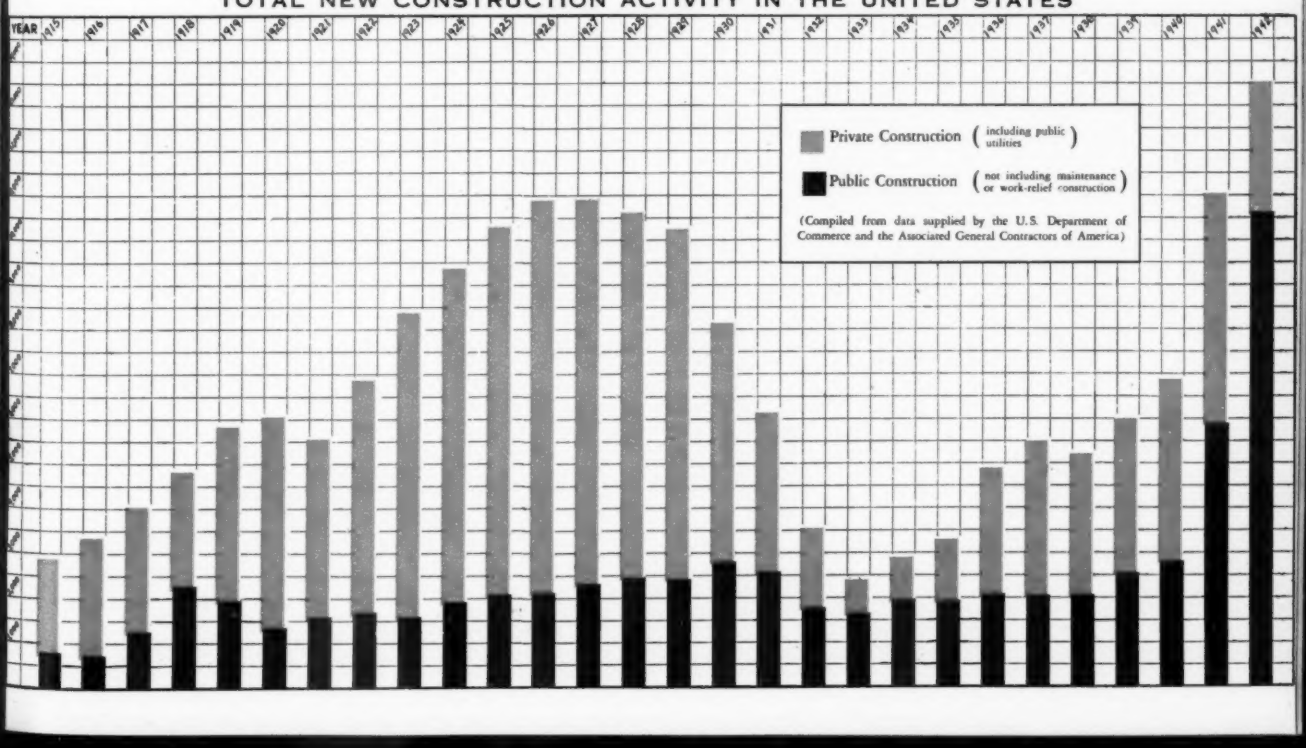
President Roosevelt transmitted to Congress (January 12, 1944) the report of The National Interregional Highway Committee recommending a "national system of interregional highways" totaling approximately 34,000 miles to be developed over a period of years at an estimated expenditure of $750,000,000 annually.

In his letter of transmittal, the President specifically proposed early action by Congress authorizing joint designation by the Federal Government and the State Highway Departments of the proposed interregional system; alternate routes to keep the actual route of new highways "fluid" to prevent unnecessarily high costs of rights-of-way and the principle of excess land condemnation. In connection with excess condemnation to control profits on land adjacent to new highways, the President asked: "If there is to be an unearned profit, why should it not accrue to the Government — State or Federal, or both?"

The 33,920-mile interregional system recommended follows in general routes of existing Federal-aid highways and would involve relocation, improvement and modernization of existing roads to recommended standards.

The recommendations call for an expenditure in the early years of approximately $500,000,000 for urban sections and $250,000,000 for rural sections. At this rate, improvement of the system would be spread over a period of from 10 to 20 years. The over-all expendi-

TOTAL NEW CONSTRUCTION ACTIVITY IN THE UNITED STATES



ture for the entire period would be divided about equally between urban and rural sections of the system.

The proposed network would be designed to eliminate traffic congestion, stop lights, cross traffic, headlight glare, constricting roadside development, steep hills, sharp curves, and narrow pavement.

Heavily-traveled sections of the system would have entrances and exits at only selected points, a 300-foot fenced and landscaped right-of-way, grade-separation structures at all intersections, no stop lights, four-lane pavement with the lanes for traffic moving in opposite directions separated by a dividing strip at least 15 feet wide, occasional moderate grades, super-elevated or banked curves at intervals, and continuous unobstructed view ahead for at least 800 feet.

The Committee said that about half of the rural mileage can be built at $40,000 to $70,000 a mile at present prices. Nearly a third of the rural mileage will require four-lane construction at costs ranging between $150,000 and $700,000 a mile. In between these two extremes is another one-fifth, most of which could probably be built for $50,000 to $70,000. Urban sections are expected to vary more widely in cost.

In directly connecting 587 cities of 10,000 or more population, the interregional routes traverse more than a third of all counties with 83 per cent of the urban population, 83 per cent of the industrial output by value, 45 per cent of the rural population, 43 per cent of the agricultural production by value, and 65 per cent of all registrations of motor vehicles.

In relation to post-war employment needs, the interregional system is well located, the report states. The routes that will be most in need of major improvement at the close of the war will supply construction employment for a considerable portion of the workers released from war industries.

A total of 29,450 miles of rural highways and 4,470 miles of urban roads and streets approximate the routes of the 33,920-mile interregional system. By regions these mileages are, respectively: 1,093 and 236 miles in New England, 1,682 and 594 in the Middle Atlantic, 4,105 and 873 in the East North Central, 3,854 and 467 in the West North Central, 3,558 and 652 in the South Atlantic, 2,609 and 380 in the East South Central, 4,088 and 512 in the West South Central, 5,662 and 372 in the Mountain, and 2,718 and 384 in the Pacific States.

The interregional highways represent the most heavily traveled routes in the country. The committee estimated that the system will serve 20 per cent of all traffic and it represents one per cent of the 3,267,717 miles of rural roads and urban streets in the United States.

The committee recommended the immediate designation of an interregional system "so that Federal, State, and municipal authorities may agree on the location of the particular roads and streets which should comprise the national routes, and so that desirable and acceptable standards may be established and plans developed rapidly for prompt post-war construction activity."

The "principal determinants" of the route locations and the total mileage of the system, the committee explains, were: (1) the interconnection of the larger cities of all regions, (2) the accommodation of short-run traffic, and (3) the creation of a system of optimum extent and maximum utilization.

"The heavily traveled sections of the proposed interregional system lie mainly within relatively narrow zones of traffic influence about cities of 10,000 or more population," the report stated. The radii of these "zones of traffic influence" range from about six miles for cities of 10,000 to approximately 35 miles for cities of three million or more.

To accommodate a large volume of short-run traffic, the committee said it attempted to connect as many as practicable of the smaller urban centers, even when this required deviation from ideally direct lines of connection between the larger regional centers. The committee points out that short-run traffic is the "predominant element" on all roads—"normally about 85 per cent of all trips are for less than 20 miles."

A major emphasis of the report is that "whatever other facilities are pro-

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Says Verne, veteran of 25-years of shovel operation: "In the last year, we lost only a day's time because of 'Old Ironguts' being down for repairs, and as our General Manager, W. A. Reaney, can tell you, maintenance-and repair costs have always been extremely low."

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In continuous service since original purchase

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"Old General Ironguts" and its outstanding demonstration of the dependability of General Excavator equipment will be worth remembering when you can buy your next shovel.

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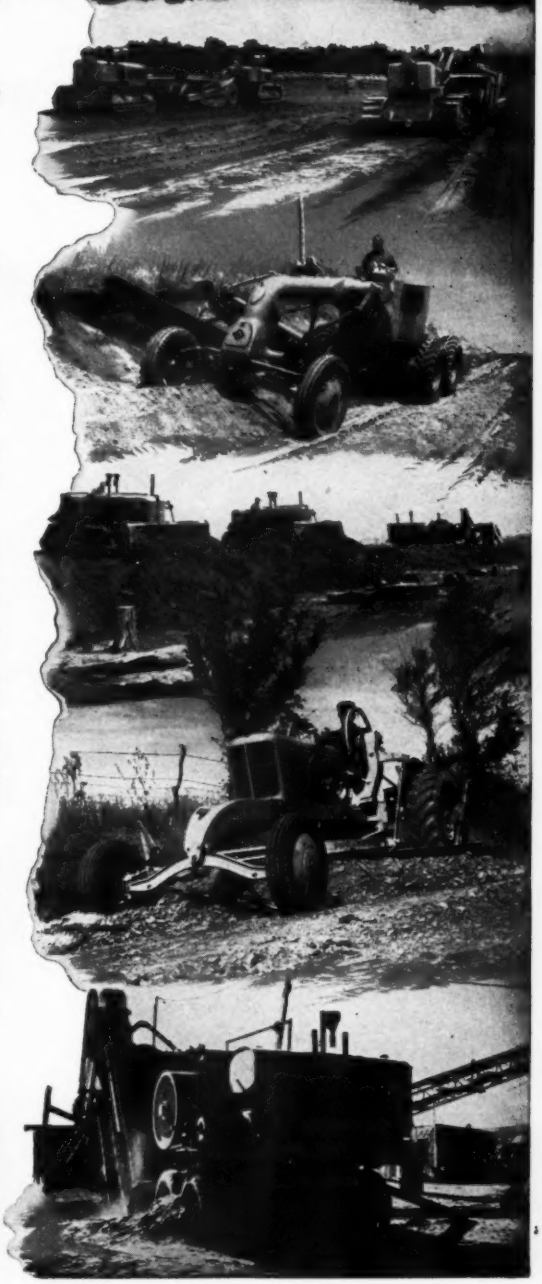
Construction men who are smashing all records building this Arsenal of Democracy know well the job that fast-moving, powerful, Allis-Chalmers 2-Cycle Diesel tractors and companion equipment are capable of accomplishing. Equally impressive is their record-breaking performance on the fighting fronts. In the thick of it everywhere, they help to speed up the offense — clearing jungles and building roads, constructing bridge approaches, airports and new bases, hauling big guns, pushing or pulling tanks and trucks through mud, mire and water . . . helping to keep the fighting men and their mechanized units rolling ahead.

Every unit we turn out for Uncle Sam and our Allies hastens the end of the struggle. You who have immediate need for construction equipment, and at present can't obtain all you want, can take real satisfaction in the thought that the machines you might have had are being put to such good use.



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● Conception of the American bulldozer as an offensive weapon drawn by Hunter Wood of the U. S. Coast Guard.

vided, the interregional system must incorporate adequate routes leading directly into the larger cities."

The expenditure of Federal-aid funds on city streets has been prohibited in the past, "because the mud of rural highways has been the greatest traffic barrier."

"Now congestion on transcity routes has replaced rural mud as the chief traffic impediment," the commitee says. "Large expenditures in the future should therefore be applied to the improvement of metropolitan sections of the interregional system."

The minimum rate at which the interregional system should be constructed will be determined by the rate of obsolescence of the existing roads that approximate it, the report indicates. By the beginning of 1944, accumulated surface-reconstruction needs on rural roads alone will total about 1,700 miles, due to deferments because of the war. If reconstruction is deferred another year, the total would be 2,650 miles, according to the report.

Bulldozer is All-around Favorite of Army Engineers

The story of an American bulldozer used as an offensive weapon against the Japs in the South Pacific war theater aroused widespread interest. Many publications printed news of the incident and others used drawings to depict an American, with his bulldozer blade uplifted as a shield, charging Jap machine gun nest, lowering the blade just before reaching the hole and burying the Japs.

The original press releases made no mention of the name of the manufacturer of the bulldozer used in this particular instance. Our artist's conception of the incident was used on the January cover. It is now reported through the Baker Manufacturing Company that the machine involved was theirs. Another artist, Hunter Wood of the U. S. Coast Guard, gives his conception of the incident in the above illustration.

We believe that this will not be the last report we receive of an American

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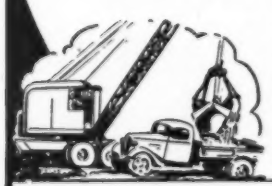

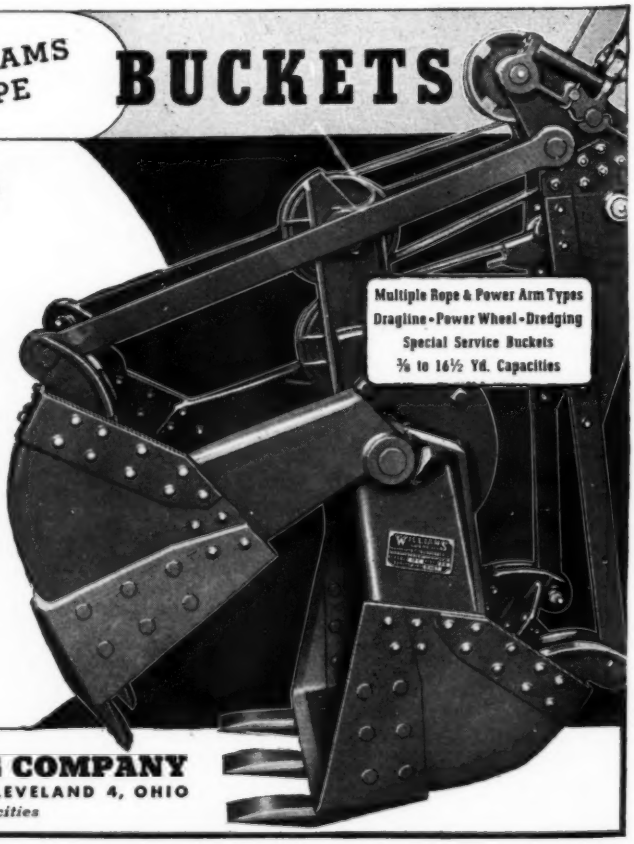

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The trek of the crew and equipment to Fort Norman.

Section of right-of-way cleared by Baker Bulldozers.

Bakers Clear Right-Of-Way for Pipe Line on Rim of Arctic!

Asphalt to extend and maintain the Alaska Highway, high octane gas for Japan-bound bombers and post-war cargo planes and diesel fuel for power in far north mines, canneries, pulp mills and fisheries will be made available by completion of the 600 mile long Canol pipe line in northern Canada.

This line will bring oil from wells at Fort Norman, Northwest Territory — trading post on the Mackenzie River — to a refinery under construction near Whitehorse, Yukon Territory.

Baker bulldozers are being used to doze trees, brush and rocks, fill gullies, level and grade, and to otherwise clear a right-of-way for the pipe line. This project was made necessary by the war and will pay off after the war, too. It will be unnecessary to haul petroleum products from the United States.

Baker overhead tie rod protects cab and operator against falling timber.

Baker hydraulic bulldozers with their direct lift and full down pressure on the blade are proving ideal for work in the frozen forest and wastelands.

The full weight of the tractor front end can be brought to bear on the blade—tough, frozen sub-arctic soils find their master in the Baker.

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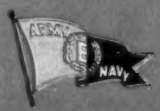

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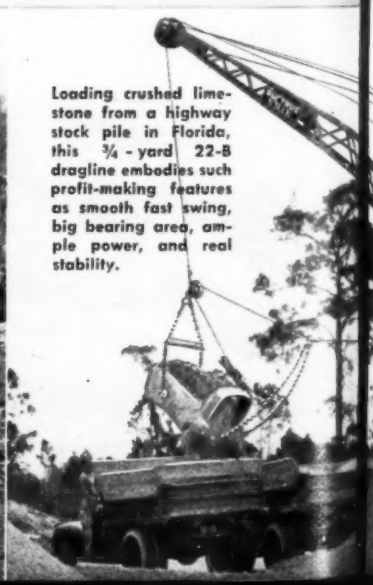
Plan Now For Postwar with

BUCYRUS ERIE

Light, simply constructed, of sturdy and compact design, the ⅜-yard, fully convertible 10-B brings real profit-making possibilities to its owner. This 10-B crane lays four miles of drainage pipe in Arkansas.

You can make the postwar years profitable by planning now to take advantage of all the money-making features which Bucyrus-Erie excavators offer. Combining big output, low maintenance costs, and proved ability to stand many hours of the toughest kind of digging, they are sure profit-makers for your excavating work. And postwar Bucyrus-Eries promise to be better than ever, for extensive war experience is constantly aiding the development of new improvements in design and manufacture.

This 2½-yard 54-B shovel excavates for a Missouri highway, putting to work its outstanding feature: control so smooth it "puts the dipper in the operator's hand."



Loading crushed limestone from a highway stock pile in Florida, this ¾-yard 22-B dragline embodies such profit-making features as smooth fast swing, big bearing area, ample power, and real stability.

Great strength, effective power, and easy control make the ½-yard 15-B a big factor in getting work done fast. This 15-B dragshovel works on a road job in Connecticut.

Bucyrus-Erie offers a full range of contractors' machines from ⅜ to 2½ cu. yd. capacities. These machines can readily be converted for use as shovel, dragshovel, dragline, crane, clamshell, pile driver, or backfiller. Whatever front-end equipment you may need, look over the line of Bucyrus-Erie excavators — in it you'll find machines that will make your work profitable and your postwar years big profit years.

This 37-B clamshell speeds the work on a cross-highway with the same proved ability that has made money for 1½-yard 37-B owners on the toughest jobs the country over.

Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

bulldozer being used as an offensive weapon. Major General Eugene Reybold of the U. S. Army Engineers Corps states that the kind of operations needed to defeat the Japs necessitates all the heavy construction equipment that the army can get. He says that the bulldozer is foremost among items of heavy equipment needed for it is the all-around favorite "because it does more things well than any other machine and it is even difficult for Japanese pillboxes and machine gun emplacements to stop it."

American heavy bulldozers are vitally necessary and are playing a major role on all war fronts.

Little Change Noted in Zinc Production

The production of zinc (in terms of recoverable metal) from domestic mines in November 1943 calculated from production of zinc concentrates by mills, individual and custom, was 65,150 tons, an increase of 447 tons over the October production of 64,703 tons, according to preliminary estimates of the Bureau of Mines, United States Department of the Interior. The average daily production in November was 2,102 tons compared with 2,087 tons in October, an increase of 15 tons a day, and 11 tons more than the 1942 daily average of 2,091 tons.

The production of the Central States, which produce nearly one-third of the United States total output of zinc, gained 86 tons in November. Operations on the lower levels of the Oronogo open pit mine were resumed the last of October following nearly three months of pumping operations to dewater the property which was flooded in May 1943. Ore from the open-pit mine is shipped to the Eagle-Picher Co. of Central mill for beneficiation.

U. S. Dam Engineer Studies India Project

John Lucian Savage, chief designing engineer for the United States Bureau of Reclamation, has left for India and China on a mission of postwar planning arranged by the United States Government. Mr. Savage, who was responsible for the designs of the Grand Coulee and Boulder Dams and has a major role in the planning of many other big dams in this country, will commute by airplane between India and China.

In the Punjab, he will spend months working on plans for the final design of a huge reservoir project to impound enough water to irrigate 2,000,000 acres, which is more land than is irrigated in any one piece in the United States. This will be done by a dam and a canal 200 miles long, to cost a total of $45,000,000. This project will provide work for thousands of natives and will eventually do much for the production of food to relieve the perpetual hunger of the people in that area—a hunger that has recently become starvation.

Comparatively little is known as yet about the biggest Chinese project, except that it will involve hydro-electric power, navigation, flood control and irrigation, with one dam alone as big as either Grand Coulee or Boulder. It is a Chungking Government project. There will be two other dams beside the giant one, but little can be said about any of them at present for a number of reasons. He will spend at least six months on the Chinese project alone and will also have a guiding part in a number of other projects which cannot be specified now.

TVA Becomes School for International Engineers

By F. N. HOLLINGSWORTH

The establishment and rise of the Tennessee Valley Authority has become a world engineering schoolroom, a development that means in postwar years the opening of big markets for American excavating and construction machinery, and probably big opportunities for American construction contractors and engineers.

From China, Great Britain, Canada, Russia, Australia, Peru, Poland, India, Mexico and Chile have come young men, engineers who want to learn how to develop the resources of their own countries by seeing how it is done at one of the biggest engineering enterprises in the world. They are studying construction methods by visiting the

for Tough Jobs

GATKE SWING FRICTIONS

GATKE Brake Lining, Clutch Facings and Frictions are CUSTOM-BILT for all requirements of Excavating, Road Building and Construction Equipment. Just tell us what you need.

Today—more than ever—you need GATKE Moulded Swing Frictions to beat tough schedules and conserve man power. For fast, accurate and dependable swinging they give you plenty extra—

Tremendous power with no letdown when things get hot.

Smooth, positive action for precision swinging—no grabbing or chatter.

Long wear life beyond belief. Months of hard service without adjustments.

GATKE Frictions are moulded to machined accuracy in all shapes and sizes. Whatever your equipment or service, just tell us what you need.

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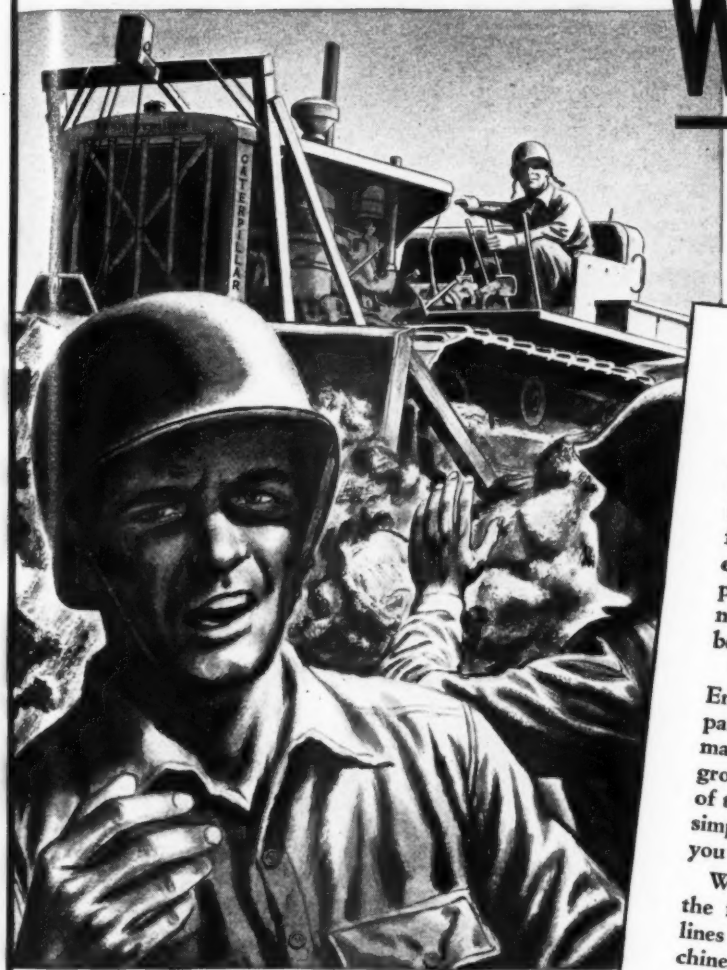
232 N. La Salle St., Chicago 1, Ill.

GATKE Moulded Swing Friction for Northwest Shovel. Made for all sizes and models.

"CATERPILLAR" DIESELS ARE WORTH WAITING FOR!



RIGHT NOW, "Caterpillar" production is bigger than it ever was in peacetime. But when the Armed Forces have taken the machines they need so much and use so well, there are nowhere near enough left to meet the world-wide demand. The War Production Board is allocating the available balance as fairly as possible among civilians whose work is essential to the war effort. Thousands of other prospective purchasers are asked to wait for their new "Caterpillar" Diesel equipment — but it will be *worth waiting for.*

"Caterpillar" Diesel Tractors, Motor Graders, Engines and Electric Sets have been good in the past. They will be better in the future. No "dream machines," but *proved* on the toughest testing-grounds the world has ever seen — the battle fronts of this war. They'll have the same ruggedness and simplicity, the same economy and dependability you have always known and liked.

When victory comes, you won't have to wait while the factory reconverts. "Caterpillar" production lines will keep right on rolling them out, and machines will be obtainable in larger numbers than ever because of our vastly expanded output.

You'll buy your new "Caterpillar" Diesels from the same trusted dealer who knows your problems. With his help in servicing and maintaining your old machines, you can afford to wait for the equipment that is your first choice.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

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REG. U.S. PAT. OFF.
DIESEL

TO WIN THE WAR: WORK—FIGHT—
BUY U. S. WAR BONDS!

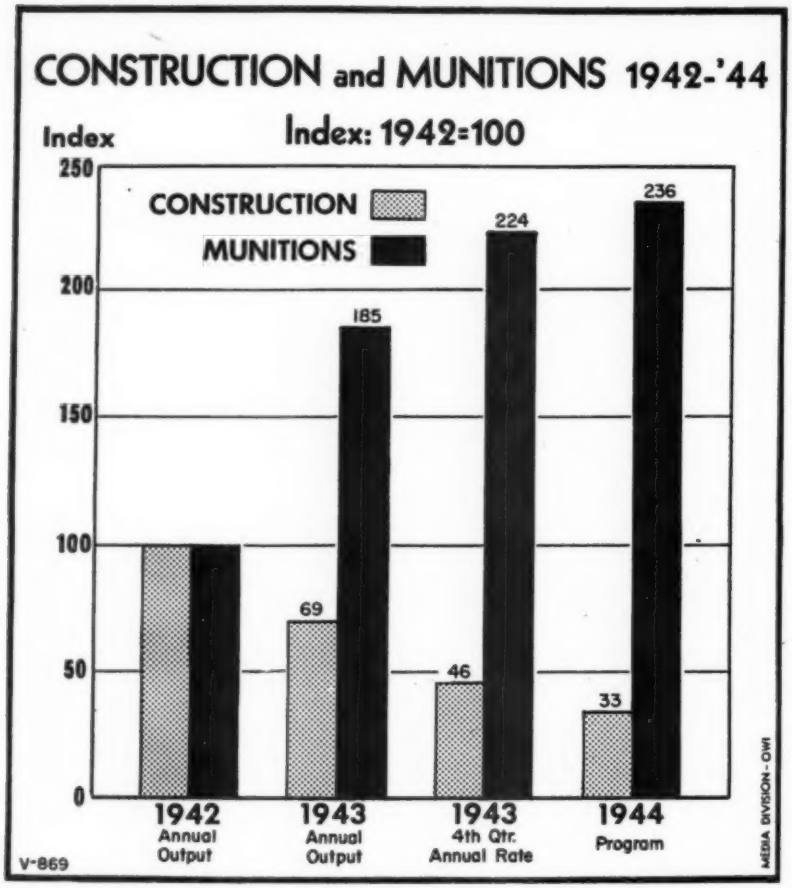
THE FIGHTING FOUR

INSPECT Look your equipment over frequently. For expert "internal" inspection of operating parts or functions, call in a trained "Caterpillar" service man. Read your Operator's Instruction Book.

LUBRICATE Use the right oil at the right time in the right place and in the right quantity. Keep the oil clean —change before it becomes dirty and deteriorated. Follow the Operator's Instruction Book.

ADJUST Tighten all bolts. Keep fan belt and tracks at proper tension. Read the Operator's Instruction Book. For fuel injection valves and other precision adjustments, let your experienced service-dealer do the work. He'll do it well.

REPLACE Have your service-dealer replace or repair worn bearings, track rollers, pins and bushings, sprockets, cylinder liners, clutch linings. His service helps restore power and extend equipment life. Saves critical materials, too.



projects under TVA studying designs and working with employees in the area, which includes portions of Tennessee, Kentucky, North Carolina, Georgia, Alabama, Mississippi and Virginia.

One of these engineers, Q. T. Chang, a member of the National Resources Commission of the Chinese Government, tells of China's plans for a Chinese TVA for which a famous American engineer, former chief engineer of the U. S. Reclamation Service, has gone to China to draw up plans. Chang is one of a group of more than ten Chinese engineers who are studying various phases of the TVA project. K. C. Mahindra, chief of the India Supply Mission has also been inspecting the TVA work and Russia has five engineers sent by the Soviet government to work with the authority in designing big hydro-electric projects in that country as part of the lend-lease arrangement.

One group from Mexico has spent six months in the Water Control Planning, Power, Design and Agricultural Relations departments, while a Honduras representative has spent eight months studying TVA.

Carleton Smith, economist and author, who has spent six months of every year for the past ten conferring with the leaders of various countries, says that throughout the world there is more interest in the TVA than in anything else being done in America.

When these various national groups go back to their own countries they will have become familiar with the possibilities of American excavating and construction equipment. Since their own countries are, and for some years will be unable to manufacture such equipment, they will be sponsors for the purchase of enormous quantities of this equipment in the United States. Thus, a postwar market for American industry is developing.

● It means no good for the Axis, but is a promise of a post-war construction era of a magnitude never equalled in our history.

Crawler Cranes Spur Aluminum Shipments

By R. P. DAY

In a Caribbean equatorial port whose identity is a U. S. Naval censor's secret, Americain-made crawler cranes have increased the shipping facilities of a bauxite trans-shipping plant by 30 per cent and these machines have made the changeover to increased production in the time it takes to unload and erect a 2½-cu. yd. crane—about 10 days.

The product being handled is bauxite, a light dusty aluminum bearing ore resembling the yellowish red clay of Oklahoma and east Texas in the United States. Because the channel at the bauxite mining site limits vessels there to the shallow draft type, a suitable trans-shipping point was necessary to permit heavier draft ocean going steamers to take on the ore. That is why the plant was set up by the aluminum company under whose control the bauxite is handled.

Originally the plant setup included two traveling hammerhead cranes which moved into position anywhere along a two-vessel dock, and clammed the ore from boat holds. Bauxite, dumped from the traveling cranes into self contained hoppers, fed on to a plant conveyor system which took it to the storage pile. When the material was re-loaded for the

A SUPER FRAME FOR A SUPER TRAILER!

Here's a trailer frame that isn't going to sag. It is extra heavy and well braced. Beams are deep and have wide flanges and more cross members are used for rigidity. It gives you strength without added weight.

Jahn Trailers have built up an enviable reputation for load carrying ability and freedom from frame troubles. This can easily be checked by contacting the hundreds of Jahn Trailer owners throughout the country.

You probably are making plans for the future. Let us send you the new Jahn Trailer Catalog to help you.

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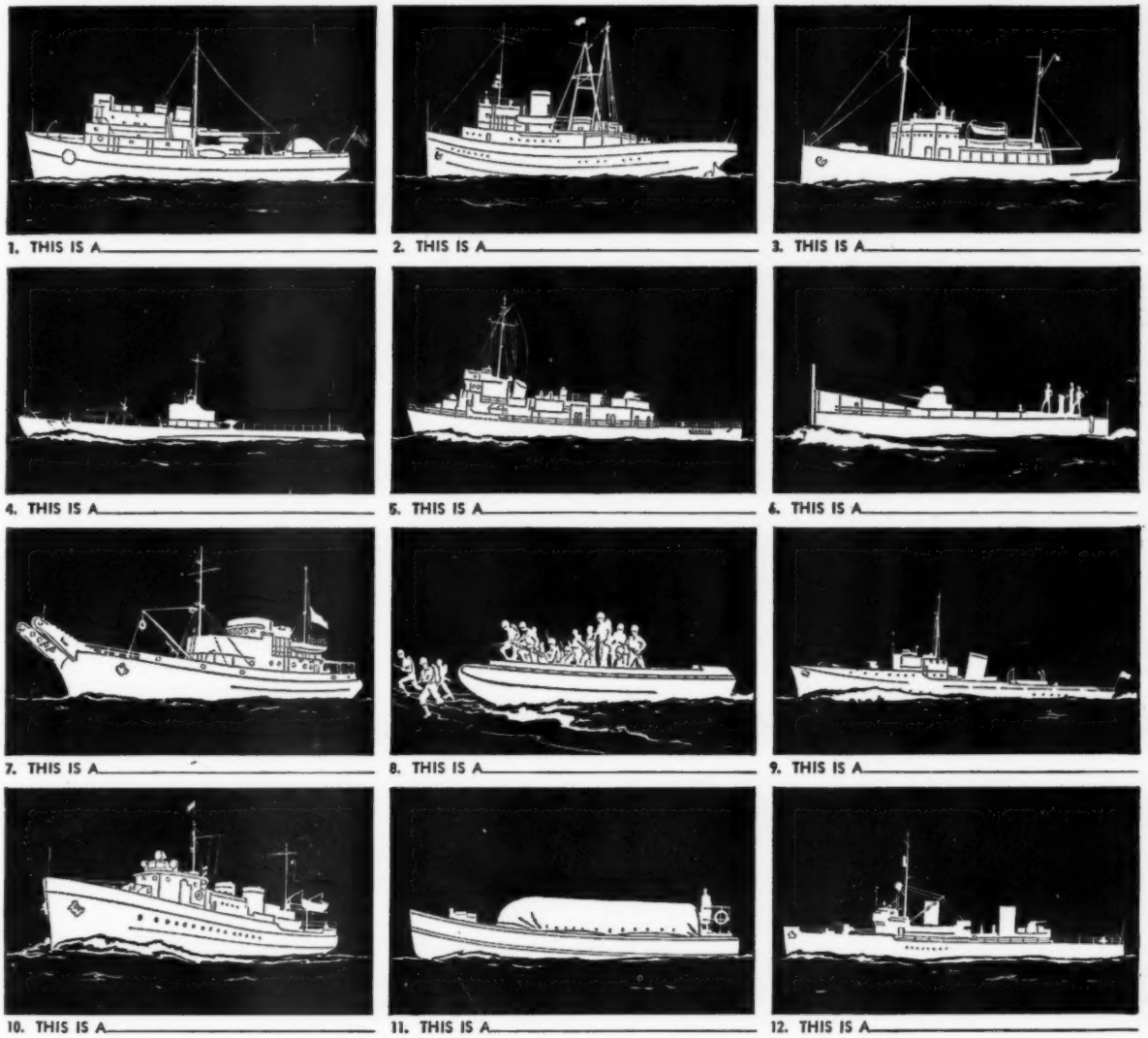
1349 WEST 37th PLACE CHICAGO, ILLINOIS

Any Axle or Wheel Combination

JAHN Heavy Duty TRAILERS
in Capacities from 5 to 100 TONS

"COME TO TRAILER HEADQUARTERS"



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10. THIS IS A_____ 11. THIS IS A_____ 12. THIS IS A_____

How many can you identify?

These boats do the "leg work" for our fleet. Their jobs are not always spectacular—but each has a critical assignment in the blueprint for victory, none must fail at a moment of decision. That's why the Diesel engines in so many of them are lubricated with Standard of California's RPM DELO.

RPM DELO ends the costly annoyance of stuck rings in Diesels. It banishes fear of bearing corrosion, stops sludge and deposits, cuts wear to the thinnest minimum.

To double the interval between overhauls in your Diesels, to cut repair bills in half—switch to RPM DELO. No other Diesel lubricant combines its anti-oxidant, non-corrosive and detergent qualities. It's America's finest Diesel lubricant.

The ships illustrated are: 1. Coastal mine sweeper. 2. Tug. 3. Coast Guard cutter. 4. Submarine. 5. Destroyer escort. 6. Tank lighter. 7. Net tender. 8. Troop landing boat. 9. Submarine chaser. 10. Coast Guard patrol boat. 11. Launch. 12. Fleet mine sweeper.

ORDER RPM DELO FOR YOUR DIESELS

RPM DELO

RPM DELO is marketed under these names:

RPM DELO • Caltex RPM DELO • Kyso RPM DELO
Signal RPM DELO • Sohio RPM DELO
Imperial-RPM DELO
CONCENTRATE

Ask your Diesel engine manufacturer or distributor for the RPM DELO supplier in your vicinity

STANDARD OF CALIFORNIA

● This Allis-Chalmers tractor with Buckeye trailbuilder is preparing the ground for laying Marsden land strips.—*Photo by U. S. Army Signal Corps.*

trip to Canada or the United States the storage pile was simply tapped by another conveyor system which ended in the hold of the outgoing vessel.

When it seemed advisable to increase the plant so that another ship could be handled, it was decided to purchase two Bucyrus-Erie Model 54-B cranes, each equipped with a 90-foot boom and a three-cubic yard Kiesler clam-shell bucket.

Release of tonnage figures handled by the crawler cranes is another military secret. Needless to say, however, vessels are now unloaded in the exceptionally fast time of from five to seven hours by the oversize clams, which bite deep into the dusty ore and come out with a pay load every trip.

In connection with this clam handling of material the company has solved a rather unusual problem of wire rope wear. Cable is necessarily abused because it is used in hoisting on the gantry mounted cranes as well as for clam closing and hoisting on the crawler machines. Clam closing, over undersized sheaves under strain, is decidedly hard on any wire rope. In addition, the dusty ore particles stick to the strands of wire rope and form a hard, crusty cake; making it impossible to lubricate the rope after the initial installation. The company, faced with these necessary difficulties of service, uses American-made preformed line on their installations because it has found that this improved type will take strained bending over sheaves and under-lubrication better than non-preformed rope of the same construction.

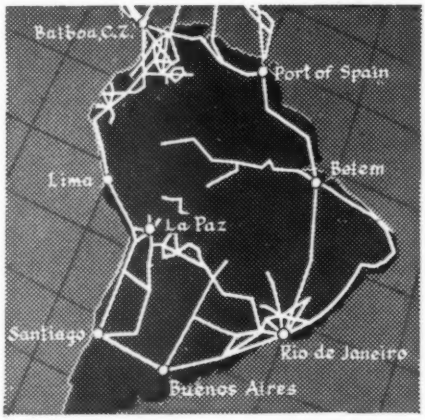
American inspired production methods and increased efficiency show up decidedly well in this Caribbean port where native hand labor is still the rule rather than the exception. Natives are still used for cleaning the gantry tracks under the machines, for keeping plant roads repaired, and for machine operation. The natives have also learned to satisfactorily operate the machines they had never seen up to a year or so ago.

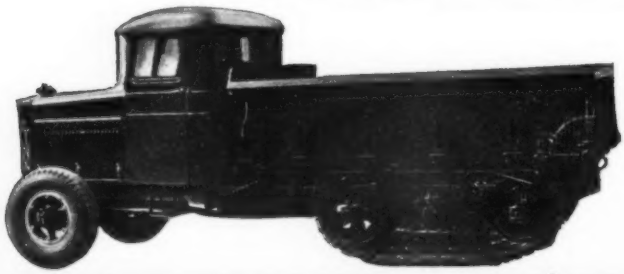
PAN AMERICAN WORLD AIRWAYS

use

LINN HAFTRAKS

to build and maintain their vital airports throughout Central and South America





THE LINN MANUFACTURING CORPORATION
MORRIS, NEW YORK

Hold Annual Meeting of Louisiana Society

The Ninth Annual Meeting of the Louisiana Engineering Society was held, together with the meetings of the local sections of the national societies, at the St. Charles Hotel, in New Orleans, January 13, 14, and 15.

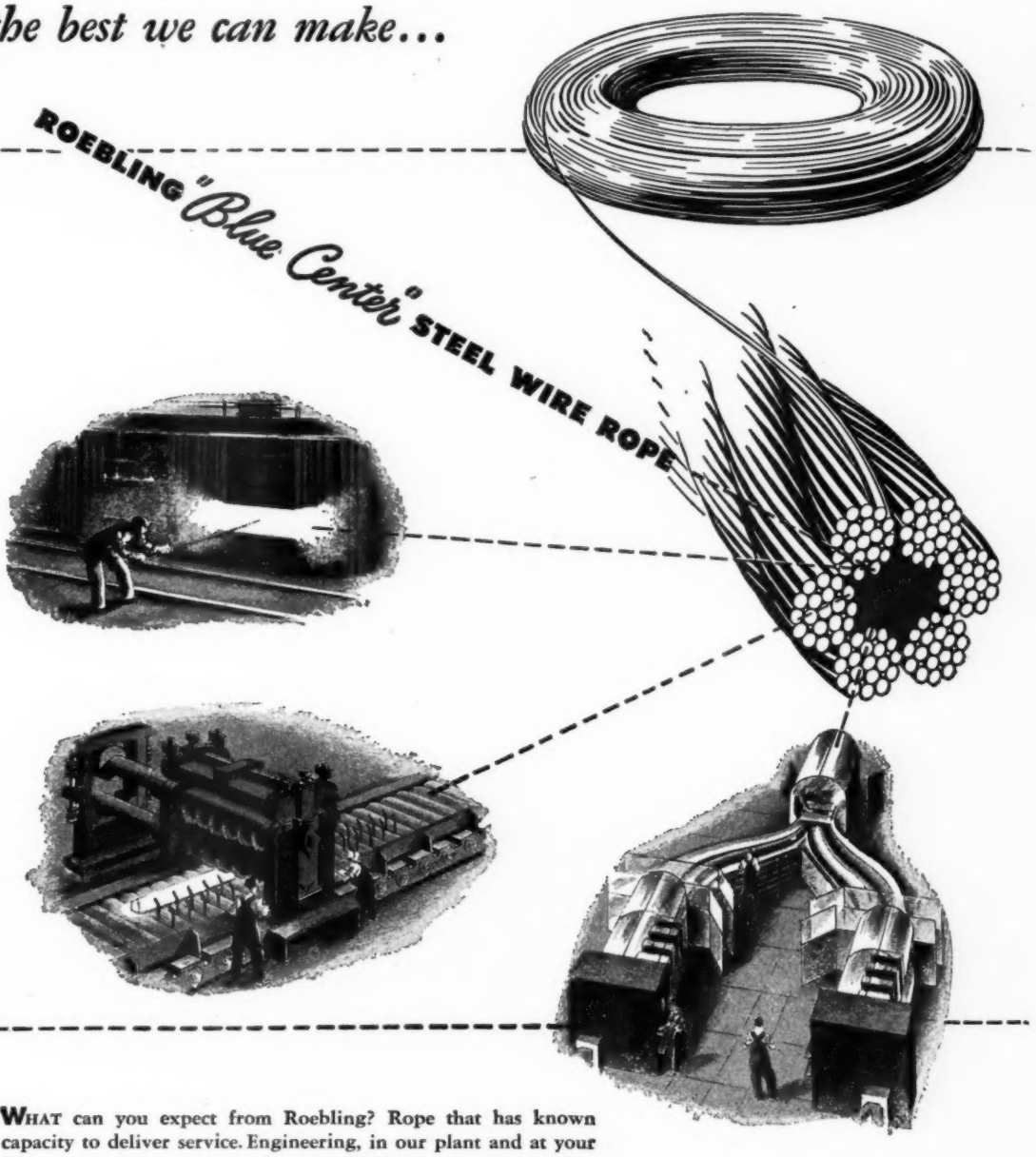
War production conferences was held in cooperation with the War Production Board. The keynote address of the meeting was delivered by Mr. A. B. Paterson, President of New Orleans Public Service, Incorporated, on the subject, "Planning for Louisiana's Post-War Problems."

Mineral Production In 1943 Sets Record

The quantity and value of minerals and mineral products produced in the United States in 1943 exceeded all previous records, Secretary of the Interior Harold L. Ickes announced on the basis of year-end estimates prepared by the Economics and Statistics Service of the Bureau of Mines.

Mineral production values reached the outstanding total of over eight billion dollars in 1943, surpassing by six percent the record of $7,569,500,000 set in 1942, Secretary Ickes was informed by Dr. R. R. Sayers, Director of the

Open hearths, blooming mills, rod and wire mills, all aimed in one direction... the production of specialized wire ...the best we can make...



WHAT can you expect from Roebling? Rope that has known capacity to deliver service. Engineering, in our plant and at your job, to put the rope to work right. Maintenance practices that protect its long life » » Your postwar profits and postwar jobs will depend in part on operating rope-rigged equipment at lowest cost. You can leave that part to Roebling.

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Wire Rope and Strand • Fittings • Cold Rolled Strip • Aircord, Swaged Terminals and Assemblies • Round and Shaped Wire Wire Cloth and Netting • High and Low Carbon Acid and Basic Open Hearth Steels Suspension Bridges and Cables • Electrical Wires and Cables • Aerial Wire Rope Systems

● Michigan crane being used to unload supplies from trucks in Iceland.—*Photo by U. S. Army Signal Corps.*

Bureau. This increase resulted from higher prices realized in 1943 and from an increase of approximately three percent in the physical volume of production.

Of the estimated grand total of $8,030,000,000 in 1943, metallic products contributed $2,500,000,000 compared with $2,361,800,000 in 1942, a gain of six percent; mineral fuels, $4,566,000,000 compared with $4,084,600,000 in 1942, an increase of nearly 12 percent; other nonmetallic minerals, $964,000,000 compared with $1,123,100,000 in 1941, a decline of 14 percent. This decline reflected chiefly the sharp curtailment in non-military construction and the resultant falling off in markets for building materials. The 1943 value was 45 percent above the World War I peak of $5,540,708,000 established in 1918.

In the metals groups, outstanding gains were registered in aluminum and bauxite, beryllium, magnesium, tantalite-columbite, and titanium; small to moderate gains were recorded for cadmium, chromite, copper, ferro-alloys, pig iron, manganese ore, and mercury production; and declines were noted in gold, silver, iron ore, lead, molybdenum, nickel, tellurium, and zinc.

In the fuels group, small gains were made in bituminous coal, and coke, and greater gains in petroleum, natural gas, and natural gasoline and liquefied petroleum gases. There was virtually no change in the production of anthracite.

Of the other nonmetallic minerals, crystalline graphite, potash, phosphate rock, magnesite, sheet mica, and salt showed marked increases, whereas cement, sand and gravel, clay products, gypsum, slate, sulphur, stone, and vermiculite experienced sharp decreases. The lime industry made a small gain over 1942.

Complete New Power Plant in Ontario

The Hydro-Electric Power Commission of Ontario recently completed a new power plant at DeCew Falls, near St. Catharine's. It is one of the most modern developments on the continent.

Its construction, begun in October, 1941, involved 33,000 cubic yards of rock excavation and 1,787,000 cubic yards of earth excavation. There were also 76,000 cubic yards of rock fill and riprap. About 44,000 cubic yards of concrete, 860 tons of reinforcing steel and 1190 tons of structural steel were used. Over 90 per cent of the construction materials were obtained in Canada. Final cost will be approximately $6,000,000. Close by is the original DeCew generating station, one of the pioneer high head developments of Canada, housing nine generating units of 50,000 horsepower. The new plant has at present only one generator, but this generator produces 15,000 more horsepower than the older plant with nine generators, and the building housing it is 75x95 feet while the older building is 50x490 feet.

Emphasize Importance of Planning at AGC Meeting

Importance of adequate postwar constructon planning was emphasized and founders and past presidents of Associated General Contractors of Minnesota were honored at the organization's 25th anniversary Founders meeting in Hotel Radisson in Minneapolis, Minn., January 13-15.

Election of officers was deferred until a board of directors meeting later in the month but three new directors were elected for three-year terms. They are W. M. Cederstrand, Minneapolis, building contractors division; Emil Zontelli, Crosby, highway contractors division, and C. H. Palda, St. Paul, heavy contractors division.

Two significant postwar resolutions also were passed by the association. In one Congress was asked for a policy declaration upon postwar construction activity. The resolution asked that the federal government refrain from engaging in postwar public works that directly or indirectly compete with private enterprise, state or local government.

The second resolution commended postwar planning efforts of Minnesota Construction Planning Committee and asked the legislature and the governor to set up a body with sufficient funds to encourage postwar planning now.

Must Register Five Types of Construction Equipment

Five critical types of heavy used construction machinery — shovels, cranes,

More Yardage with Less Labor

Sauerman Slackline Cableway digs material in gulch and conveys 1,000 ft. to bin on hill where processing plant is located.

Sauerman Scraper Machine with mobile head tower equipped with loading ramp makes a long, wide cut and loads sticky material into cars at rate of 250 cu. yd. hourly.

Large savings in man-hours are effected by using Sauerman Drag Scrapers and Slackline Cableways in sand and gravel excavation, stockpiling and other material-handling jobs where the long operating range of these machines can be employed to advantage.

With one man at the controls, and with a relatively small expenditure of power, a Sauerman machine will dig, haul and automatically dump a large hourly tonnage of any class of earth or bulk material. Moreover, the cost of the equipment is moderate and upkeep is simple.

GET THIS USEFUL BOOKLET — Typical examples of pit pond and bank excavation, stockpiling and reclaiming, moving loose rock and ore, etc., are pictured and explained in the Sauerman catalog. A copy is yours for the asking. Write now.

SAUERMAN BROS., INC.
574 S. Clinton St. Chicago 7, Illinois

The big jobs of tomorrow will require big men with broad ideas and big, sturdy machines to do the work.

The equipment which is having its trial-by-fire in this global war will be all the better suited for the gigantic tasks of reconstruction. The magnitude and scope of the engineering jobs which await America are almost beyond conception—but when it comes to Heavy-Duty Trailer Equipment, we are ready.

Fruehauf pioneered the Carry-all type of heavy Trailer. Today we have an entire plant devoted to making these units for war. Their capacities run from 8 to 60 tons. They carry many types of battle equipment, even up to great tanks with heavy guns and armor.

Many of the features of these war-time Fruehauf heavy-duty Trailers have always been incorporated in our units. Many other features are the direct result of war's demands and military experience. Combined, they will enable Fruehauf Carry-alls to render vital and immediate service in the era of postwar construction.

World's Largest Builders of Truck-Trailers

FRUEHAUF TRAILER COMPANY • DETROIT

Service in All Principal Cities

"ENGINEERED-

FRUEHAUF Truck-TRAILERS

-TRANSPORTATION"

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TRUCK-TRAILER TRANSPORT IS DOING AN ESSENTIAL JOB FOR ALL AMERICA

. . . YOUR 4TH WAR LOAN QUOTA

WHETHER your plant meets its quota, or fails, lies largely in *your* hands. Your leadership can put it over—but if you haven't already got a smooth running, hard hitting War Loan Organization at work in your plant, there's not a minute to lose.

Take over the active direction of this drive to meet —*and break*—your plant's quota. And see to it that every one of your associates, from plant superintendent to foreman, goes all-out for Victory!

To meet your plant's quota means that you'll have to hold your present Pay-Roll Deduction Plan payments at their all-time high—plus such additional amounts as your local War Finance Committee has assigned to you. In most cases this will mean the sale of *at least* one $100 bond per worker. It means having a fast-cracking sales organization, geared to reach personally and effectively every individual in your plant. And it means hammering right along until you've reached a 100% record in those *extra* $100 —or better—bonds!

And while you're at it, now's a good time to check those special cases—*growing more numerous every day*—where increased *family* incomes make possible, *and imperative,* far greater than usual investment through your plant's Pay-Roll Deduction Plan. Indeed, so common are the cases of two, three, or even more, wage-earners in a single family, that you'll do well to forget having ever heard of '10%' as a reasonable investment. Why, for thousands of these 'multiple-income' families 10% or 15% represents but a paltry fraction of an investment which should be running at 25%, 50%, or more!

After the way you've gone at your wartime *production* quotas—and topped them every time—you're certainly not going to let anything stand in the way of your plant's breaking its quota for the 4th War Loan! Particularly since all you are being asked to do is to sell your own people the finest investment in the world—*their own share in Victory!*

LET'S ALL BACK THE ATTACK!

This space contributed to Victory by
Excavating Engineer

This is an official U. S. Treasury advertisement—prepared under auspices of Treasury Department and War Advertising Council.

draglines, motor graders, and track-laying tractors — must be registered by their owners in the nearest WPB Regional Office, but registration of many other items is no longer required, the War Production Board announced. This change is made in a revised version of the order controlling used construction machinery.

Practically all new construction machinery is now needed by the military, and civilian demand must be filled from idle used equipment. The Order (L-196), first issued in the fall of 1942, set up an inventory of used equipment through compulsory registration by means of which idle equipment was listed and made available to those who needed it. Registration was originally required for over a hundred separate items. This number was reduced through successive amendments and exceptions so that the WPB Construction Machinery Division could concentrate on giving assistance in locating types of equipment that were and are most in demand. Latest changes to the order are designed to eliminate further unnecessary paper work on items which are fairly numerous and which change hands readily.

● Caterpillar tractor and LeTourneau angledozer knock over rows of shallow-rooted coconut trees as the Engineers go into action somewhere in the South Pacific to widen a road to a fighter strip.—*U. S. Army Signal Corps Photo.*

Chief among items no longer covered by L-196 are construction material batchers, jaw and roll crushers (portable type), crushing plants (portable type), blade ditchers, portable mounted rock drilling machines, bituminous paving finishers, concrete paving finishers, earth moving graders (blade and pull type), agitator mixers (concrete truck type with or without elevator towers), concrete construction mixers of 7 cu. ft. capacity and larger, concrete pavers and tandem road rollers.

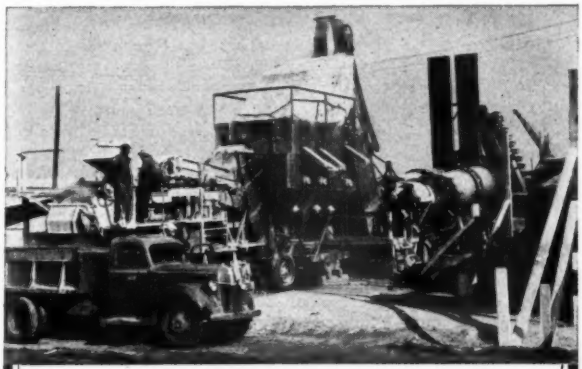
Used equipment covered by L-196 as amended is listed in Schedule A, attached to the Order.

Chief provisions of the order are:

Motor graders—self-propelled, earth-moving, rubber tired mounted, 16,000 pounds and heavier, tandem and four-wheel drive types.

Tractors — crawler or track-laying type, all gauges, bare and including tractor mounted equipment such as bulldozers, angledozers, cranes, loaders, power control units, etc., all diesel and semi-diesel powered models and specified gasoline powered models.

Elective dates — registration of equipment bought before January 18 —



B-G Central Plant

★ Barber-Greene provides a complete, highly accurate, large volume plant for the production of every type of bituminous mix. The three basic units are mounted on pneumatic tires for maximum portability and minimum erection time.

The Barber-Greene booklet, "Versatility", completely describes the various setups of the mixer. It can be obtained from your Barber-Greene representative without obligation.

Q-31

BARBER GREENE
AURORA ILLINOIS

HAYWARD BUCKETS
GOOD FOR YEARS OF HARD SERVICE
A HAYWARD Bucket is an investment, not a gamble. It helps you make a profit on every job.
THE HAYWARD COMPANY
52-54 Church Street
New York, N. Y.

NEED A BIG Trailer?
La Crosse Makes Them Up To 200 Ton Capacity
WRITE OR WIRE
LA CROSSE TRAILER & EQUIPT. CO.
LA CROSSE, WISCONSIN U.S.A.

● This Bucyrus-Erie ¾-cu. yd. Caterpillar diesel-powered tunnel shovel loads rock into trucks in the Thompson Crushed Rock Co. limestone quarry at Turner, Kansas. Two Diesel D4 tractors with Tracklson Traxcavators are also used in the quarry. These three units supply all the rock for a crusher which produces about 250 tons of rock per hour.

on or before February 17 — registration of equipment bought after January 17 — must be made within seven days after purchase. Registration of change of status — within one week of change. Restrictions on sale — February 2, 1944.

Reclamation Bureau Creates Power Utilization Branch

Recognizing the increasing importance of power as a partner to irrigation in the war-time and post-war agricultural and industrial development of the West, a Branch of Power Utilization has been established within the Bureau of Reclamation, Secretary of the Interior Harold L. Ickes announced.

The Secretary said that on the recommendation of Commissioner Harry W. Bashore he had appointed as director of the new branch Harvey F. McPhail, who has been with the Bureau for nearly 25 years and for the past 15 years has been assistant chief electrical engineer in the Bureau's engineering office at Denver, Colorado. McPhail is a graduate electrical engineer of the University of Nevada. He will be stationed in Washington, D. C. for the present, but later permanent headquarters will be established in Denver.

Continue Construction on Buffalo Rapids Project

Approval by President Roosevelt to continue construction of the second division of the Bureau of Reclamation's Buffalo Rapids project in Montana under the newly amended Water Conservation and Utilization Act, was announced by Secretary of the Interior Harold L. Ickes.

The presidential authorization will make available $706,000 from W. C. U. funds in lieu of contributions previously made by the disbanded Work Projects Administration and the Civilian Conservation Corps. The total estimated cost of the second division is $1,628,000. The president granted the approval to continue construction with the stipulation that no commitments for construction of the Fallon unit, one of three, will be made until adequate priority ratings for materials required are issued by the War Production Board.

Reclaim West Indies Swampland with Scraper, Bullgrader

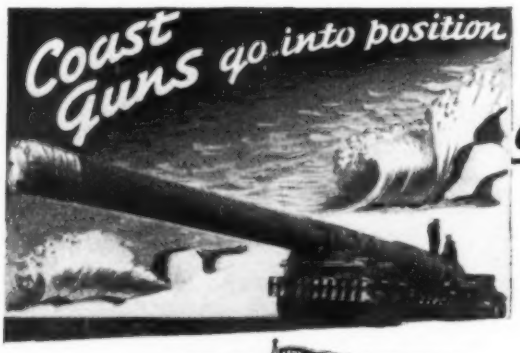
By R. P. Day

Five miles out of Port-of-Spain, Trinidad, in the British West Indies, a British real estate operator is using a bullgrader and a scraper to reclaim 200 acres of boggy swampland not ordinarily tackled with heavy earthmoving machines.

The real estate operator, P. C. Collins, faced the problem of moving low cost dirt with heavy machines (they were the only ones available) in a swampy territory so soft that there was always danger of the machines bogging out of sight.

Collins brought in an International TD-18 tractor equipped with a Bucyrus-Erie hydraulically controlled bullgrader blade. Starting this machine in good ground at one end of the development scheme, he cleared the tract of jungle growth and small coconut palms, exposing the borrow dirt which he proposed to use in filling the Caribbean bordered swamp. This bullgrader sometimes got itself mired, but by exerting down pressure on the blade the operator would raise the machine high enough that coconut palm logs could be slipped under the front end of its tracks. In this way the International always got out of trouble.

As soon as the borrow pit was ready, Collins brought in a Caterpillar D-7 tractor and a LeTourneau Model FP Carryall. The Caterpillar was also equipped with a LeTourneau bulldozer blade.

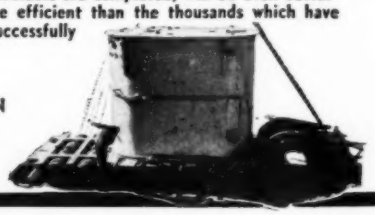


SAFE from Invasion is no idle boast today. The enemy has been driven from the Alaskan outposts and they dare not attack us here!
ROGERS TRAILERS have played a big part in fortifying our coastlines and they are fighting with our men overseas!

on ROGERS TRAILERS

The ROGERS TRAILERS which will be available to industry when present war contracts are completed, will be even better-engineered and more efficient than the thousands which have been operated so successfully for many years.

ROGERS BROS. CORPORATION
ALBION,
PENNA.



EXPERIENCE builds 'em PERFORMANCE sells 'em

WHEN THERE'S WORK TO BE DONE —IN WAR OR PEACE

YOU will find GM Diesels hard at work in every theater of the war. They power massive tanks moving into battle, heavy trucks in endless supply lines, tractors to clear landing fields, landing and assault boats, big submarines and fast subchasers in home and in foreign waters.

In every respect, these GM Diesel Engines are living up to all that was predicted for them—and more. In many instances they are doing an even greater variety of jobs than they were designed for. They are standing up under conditions that couldn't possibly have been foreseen.

When the war is over, GM Diesels will be ready to serve the peace as they are serving in war. With this difference: expanded production facilities, together with improvements and refinements in design and construction, will make them even more available for use—more capable of reliable, low-cost performance.

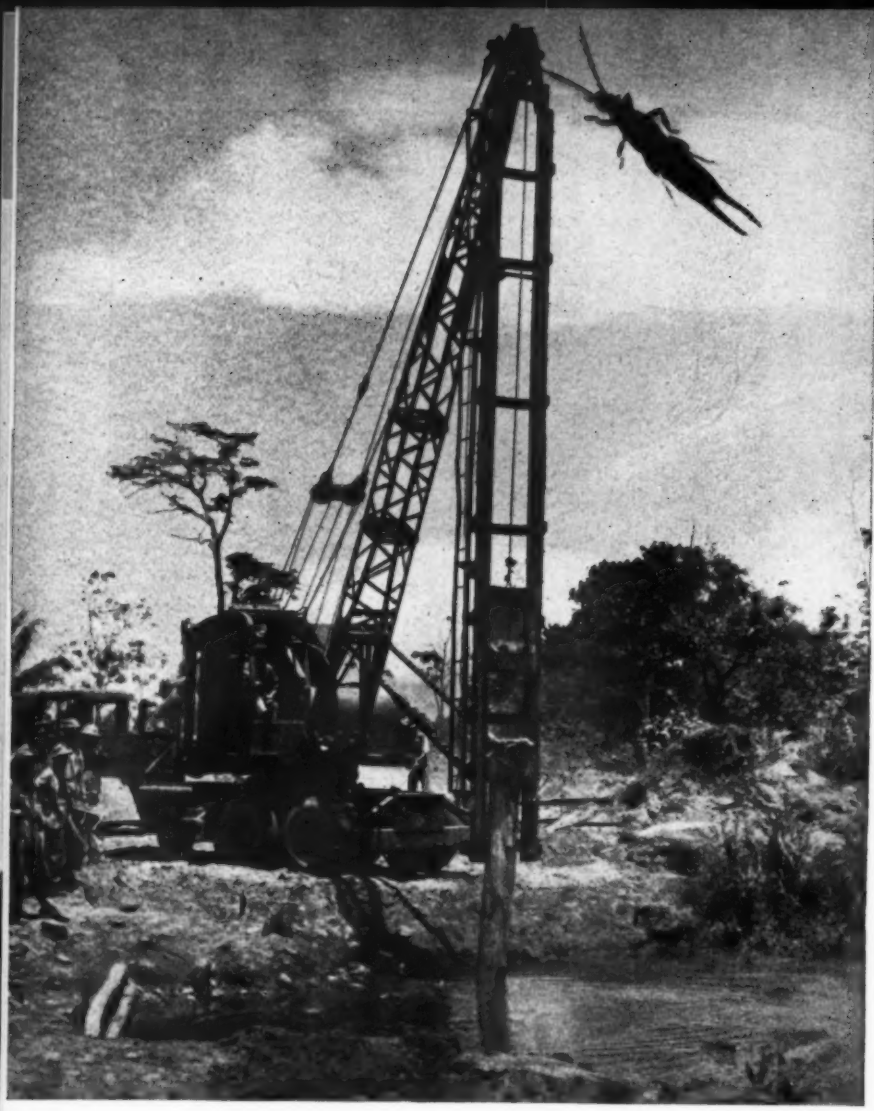
GM Diesels will be on hand to show that they can do an even bigger job in America's trucks. Simple in mechanical construction; sturdily and precisely built; economical in operation and upkeep, GM Diesels will prove as indispensable in peace as they are proving vital in war.

GM
GENERAL MOTORS
DIESEL POWER

ENGINES..15 to 250 H.P...**DETROIT DIESEL ENGINE DIVISION,** Detroit, Mich.

ENGINES..150 to 2000 H.P...CLEVELAND DIESEL ENGINE DIVISION, Cleveland, Ohio

LOCOMOTIVES.....ELECTRO-MOTIVE DIVISION, La Grange, Ill.



● Engineers of the U. S. Marine Corps in the South Pacific will match their Gremlins against those found anywhere else in the world — and they have pictorial proof to offer. This photo shows one of the Gremlins apparently zooming to attack this Bucyrus-Erie 15-B transit crane being used as a pile driver. The bug had crawled into the camera and was silhouetted when the photo was snapped. *Wide World Photos*

Using the Caterpillar and scraper, Colline built a storage ramp at the seaward edge of solid footing, hauling as much as 120 cubic yards an hour. After the ramp had been built up high all the way along the swamp front, the carryall was dropped, the cable operated bulldozer picked up by the power control unit, and the Caterpillar machine thus equipped as a dozer pushed the stock pile toward the sea in thick 6-foot layers.

The soil, mostly heavy red clay, packed in tightly when pushed in this manner. One stock pile would push the development scheme about 40 feet into the swamp. As this rehandling process was repeated over and over, more and more land was reclaimed. When the borrow area had been graded down to meet the gentle slope toward the sea the area was ready for dwellings.

The project was protected from erosion by extending native stone jetties out into the water along both sides. Frontal erosion will be prevented by placing rock riprap along the shore as soon as the fill had finally settled.

Jardine Heads N. D. Highway Contractors

J. A. Jardine of Fargo was reelected president of the North Dakota Highway Contractors Association at its annual meeting Jan. 4 in Jamestown, N. D. Also named were: vice president, Archie Campbell of Warwick; secretary, Jessie Blewett of Jamestown, and directors, George E. Haggart of Fargo, John McCormick of Fargo and Campbell.

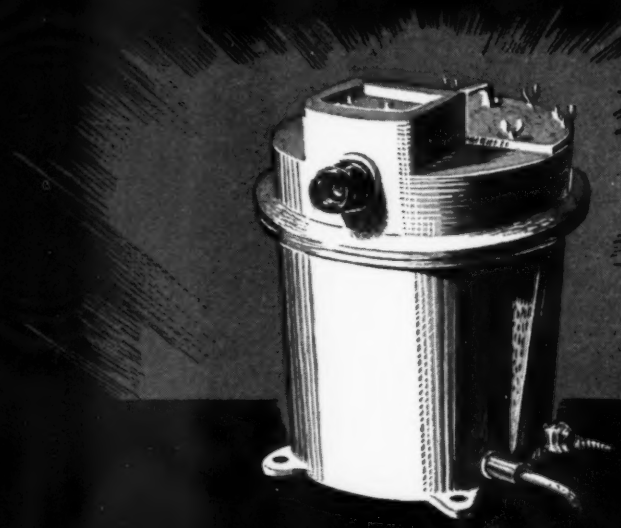
Hoffman to Speak at ARBA Annual Meeting

Paul G. Hoffman, president of the Studebaker Corporation and chairman of the Committee for Economic Development, will be one of the headline speakers at the American Road Builders' Association Postwar Highway Conference, according to Charles M. Upham, Engineer-Director. The Conference will be held in Chicago, February 1, 2 and 3, in the Edgewater Beach Hotel.

One of the highlights of the Conference will be the panel discussion of whether there will be dumping of surpluses of construction machinery by the Army and Navy. Representatives of

THE OWEN BUCKET CO.
6095 Breakwater Avenue Cleveland, Ohio
Branches: New York, Chicago, Philadelphia, Berkeley, Cal.

WORLD'S FASTEST CAMERA
Charts a Burst of Dynamite



TO CAPTURE pictures of explosives *in action,* Hercules scientists designed and built the world's fastest camera. Operating at exposures as fast as *one ten-millionth of a second,* this amazing instrument photographs dynamite at the very instant of its violent chemical change. Even powerful nitroglycerin's path of detonation, traveling at 250 miles a minute, is "stopped" on film by this shutterless, electrically operated camera.

This study of how explosives behave is only a small part of the intensive research being conducted daily by Hercules. Physicists, x-ray workers, microscopists, and other highly trained specialists are constantly searching for new and valuable knowledge on explosives which may prove helpful to you and your business.

---------- *HERCULES EXPLOSIVES* -----

HERCULES POWDER COMPANY
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XR-40

● Bulldozer being put aboard a transport plane at an airfield in North Africa.—*Photo by U. S. Army Signal Corps.*

the U. S. Treasury, the War Production Board, of Congress, and of the highway industry will participate.

Fluorspar Industry Again Makes New Record

The domestic fluorspar industry was called upon to supply an unprecedented demand in 1943 and producers responded by producing and shipping 408,000 and 406,000 short tons, respectively, of finished fluorspar, gains of 21 and 13 per cent over 1942, the previous record year, according to the Bureau of Mines, United States Department of the Interior. Production and shipments in 1943 were adequate to cover domestic consumption, which amounted to 386,000 tons, an increase of 7 per cent over 1942, the former record year.

Portland Cement Output in Further Decline

Output of 9,218,000 barrels of finished portland cement during November, reported to the Bureau of Mines, United States Department of the Interior, was 43 percent below production in the corresponding month of 1942 and also was appreciably lower than the average November production during 1935-39. The decline from October 1943 was more than seasonal, thereby extending the long-term downtrend in activity which has been continuing at an accelerating rate each month since January 1943. Shipments from mills during November totaled 8,405,000 barrels; a decline of 43 percent from the movement in November 1942 and a sharp drop from October 1943. The November 1943 shipments were approximately the same as average November shipments during 1935-39. Production exceeded shipments during November so that stocks of finished cement at the end of the month advanced to 20,386,000 barrels and were at approximately the customary operating level for this time of the year. The November 30 stocks were 66 per cent greater than on the same date in 1942 at which time recovery from the serious depletion during May-October 1942 had only started.

OBITUARIES

Edward E. Staley

Edward E. Staley, 72, chairman of the board of directors of The Baker Manufacturing Company, died December 23, at his home in Springfield, Illinois, after an illness of several years.

Mr. Staley became secretary of The Baker Manufacturing Company in 1917, and its president two years later. He was elected chairman of the board in 1940, being succeeded as president by his son, W. C. Staley.

Under the leadership of E. E. Staley, during his 20 years as president, The Baker Manufacturing Company attained a prominent place among the manufacturers of bulldozers, construction equipment and snow plows.

David B. Piersen

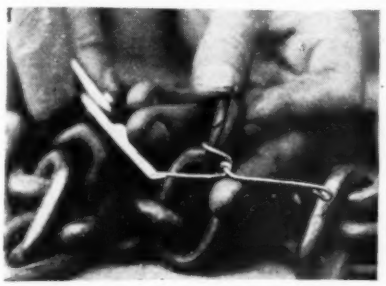
David B. Piersen, 63, chairman of the board of directors of the Stephens-Adamson Manufacturing Co. of Aurora, Illinois, died of a heart attack on November 29.

He started with the Stephens-Adamson Mfg. Co. when that company was founded in 1900 and served as sales manager, secretary and vice-president before being elected president in 1914. Since 1934 he had been active in sales and administration as chairman of the board.

Field NOTES

Marking Defective Links

Frequently, after inspection, defective chains are thrown or tossed to one side, marked with a tag or some other improvised identification which is liable to be lost or torn off. Another person, unaware of the condition of



the chain, uses it and gets into trouble. A defective link is often discovered when there is no convenient means of plainly marking it.

A very practical and efficient way to prevent use of such a chain until repaired is shown in the illustration. A short piece of fairly heavy wire is twisted around the bad link and the ends of the wire are bent to prevent sharp points. Anyone laying or pulling the chain out for use cannot help but see the wire and the defective links will not straighten out with the rest of the links. A piece of wire sufficiently long can even be twisted on with the fingers.

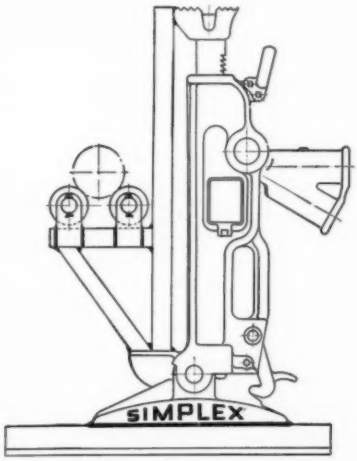
FRANK W. BENTLEY, JR.

Improvised Reel Jack

Here is an idea which should be welcomed by any concern having a quantity of cable to reel or unreel. An ingenious employee of the Harnischfeger Corporation branch at Dallas, Texas, evolved this simple adaptation of an ordinary Model 310 Simplex Jack which is being successfully used in the company's warehouse for spooling wire rope. The makers of Simplex have a line of 13 reel jacks, but this is a handy man's way of cutting a corner.

A 1″ x 1″ steel bar has been welded to the toe lift of the jack. This carries a bracket extension which in turn supports two rollers which carry the three inch pipe spindle. This bracket extension is about six inches and was necessary because the toe of the jack was not long enough to accommodate the rollers or size of pipe spindle necessary for large cable reels. It was also necessary to weld an extension to the base of the jack because the center of gravity had been shifted forward. Without it, pulling the cable from the reel would cause the jack to topple over.

The spindle is provided with a flange which in practice keeps the side of the reel opposite a fraction of an inch higher. This keeps the reel properly centralized when unspooling cable. Small flanges or collars are also provided for both sides of the rollers. Without these flanges the reel, unless absolutely level, would drift to the lower side and come in contact with the jack, preventing turning.



● Simple adaptation of an ordinary Model 310 Simplex Jack for spooling wire rope.

Snow Bucket Made From Salvage Material

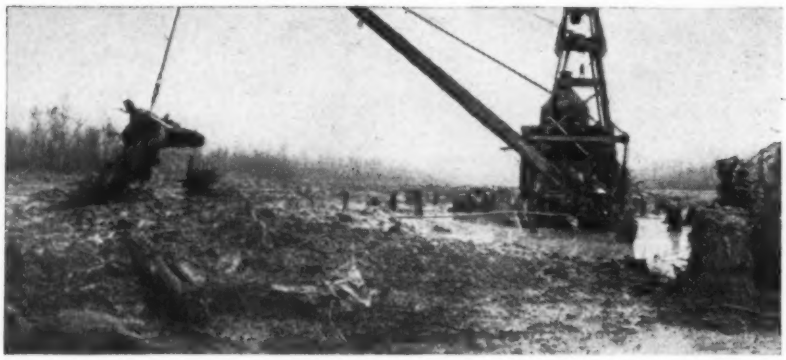
Formerly requiring a large crew of men three or four days to remove by manual labor the snow from the yards of the Cliffs Dow Chemical Company plant in Michigan, it now requires only about one day with one man operating a tractor-powered snow bucket made from salvaged material.

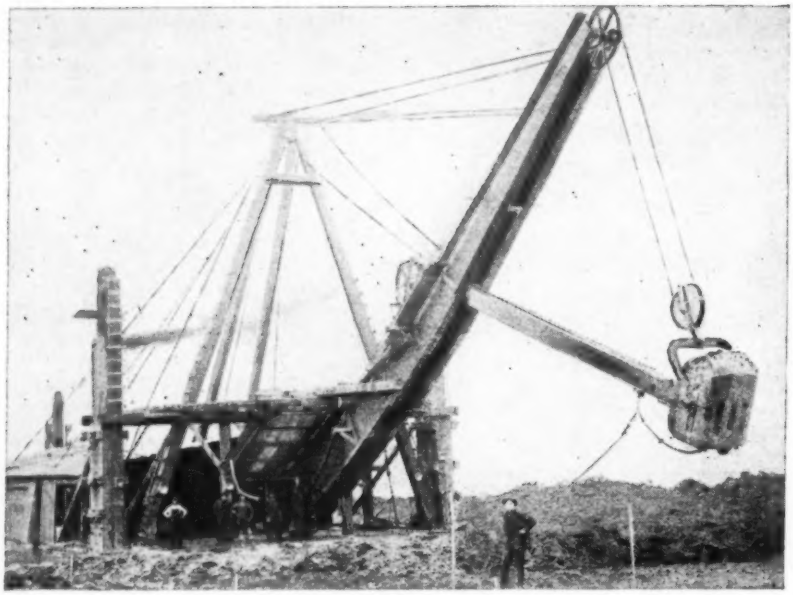
No new steel was used on any part of this snow bucket. Completely fabricated by arc welding, the bucket is 72″ across, 42″ high and 46″ deep. The capacity is approximately 1¼-cu. yds. of snow. Labor for welding and preparing was $85.54; material and welding electrodes $35.31 and painting $7.00, making a total of $127.85. A riveted bucket would have run in the neighborhood of $600.00, so that by welding not only was it much cheaper to construct, but it also resulted in a lighter bucket to be raised by hydraulic pumps, allowing larger amounts of snow to be handled at one time.

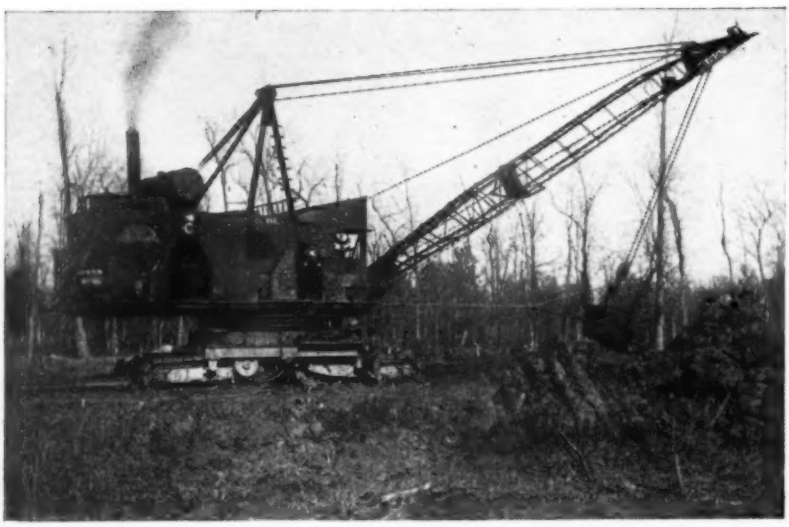
The brackets that hold the bucket to the push beams are of 3″ x 3″ angle. These form a channel through which four pins are dropped to hold bucket in place and to hold the latches on a rocker arm for dumping the bucket. A cable runs back to the tractor driver for releasing these dogs. After the snow is dumped the driver lowers the bucket to the ground and backs up. This snaps the dogs in place and the bucket is ready to load again. When loaded and moving the driver has 42″ of road clearance.

● Tractor-powered snow bucket, made entirely of salvage material without the use of steel, being used by Cliffs Dow Chemical Company plant in Michigan.

Photograph Courtesy The Hobart Brothers Co.







● **Top: This is the method of stump-pulling used in clearing the land before drainage ditches were excavated.**
Middle: This old Fairbanks 3½-cu. yd. dredge shovel on a barge dug its way through a goodly section of the district excavating ditches and channels for drainage. Note the wooden boom and A-frame. The man in the foreground is T. G. Whitelaw, present maintenance overseer of the District.
Bottom: Bucyrus steam shovel used for excavating in earlier days of the drainage district.

Little River . . .

(Continued from page 63)

$12,163.17 or $.0607 a cu. yd. From November, 1941, to September, 1943, 28.89 miles were covered and 273,712 cu. yds. of excavation moved at a cost of $16,763.67, or $.0612 a cu. yd. Increased labor cost was principally responsible for the $.005 per cu. yard cost increase.

For the past two years the Bucyrus-Erie dragline has been equipped with a Servis Recorder, a graph arrangement that automatically records on a circular cardboard disc machine performance and shut-downs.

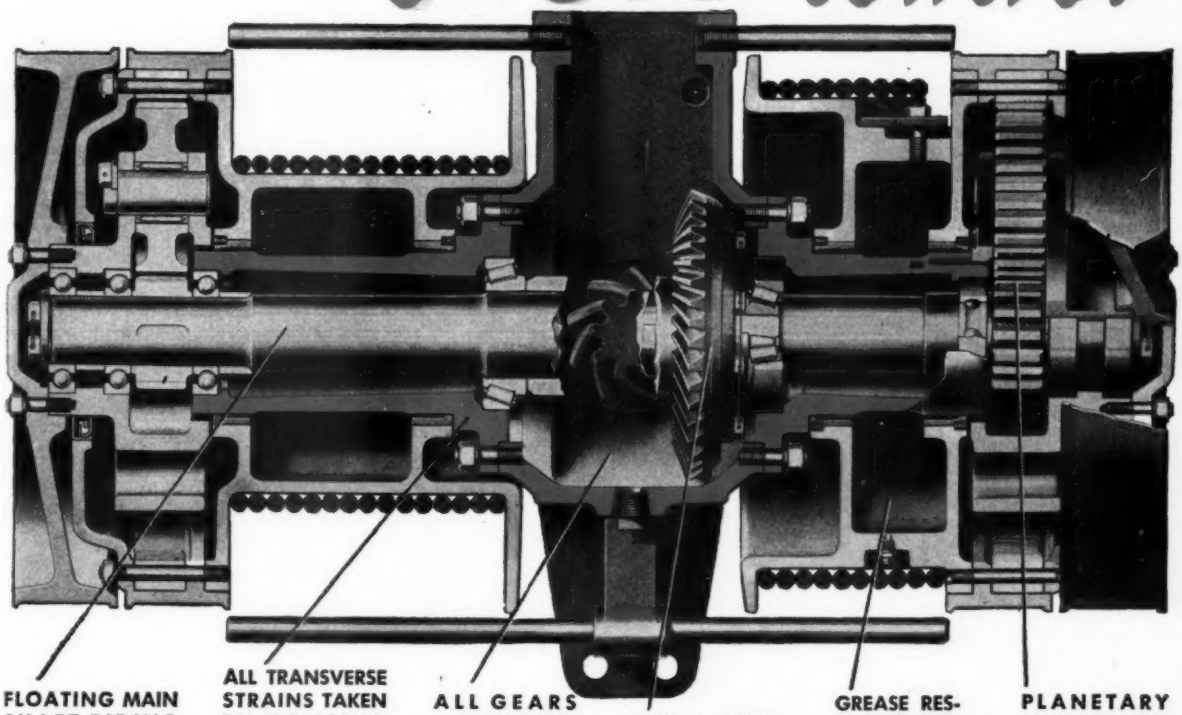
The Little River Drainage District has one contractor, S. J. Peterson of Fairfax, Mo., now working in the district. Peterson is using two Link-Belt Speeder draglines, one with an 85-foot boom and 2½-cu. yd. bucket and the other with a 65-foot boom and 3-cu. yd. bucket.

A weed-cutter boat purchased three years ago from C. L. Hockney of Silver Lake, Wis., is used to keep the ditches clear. This boat is 14'x5' with an overall length of 24 feet with sickle attached. It weighs 1,200 pounds and is powered by a four cycle, 5 h.p. marine motor. The rotary sickle attachment has six to eight-foot blades that cut under water.

There are two engineer crews composed of an engineer, or chief of party, a rodman and two chain-men working all year around for the district laying out cross sections before and after excavation. Mosquito control work is carried on in the district under the supervision of the Federal government.

The board of supervisors of the Little River Drainage District are: W. P. Anderson, president; H. I. Himmelberger, Charles B. Baker, Albert Painton, and S. P. Reynolds. B. F. Burns is secretary-treasurer. Bucyrus-Erie dragline operators are Howard Latimer, head operator, first shift; Ed. Hessling, second shift, and W. G. Sherman, third shift.

look into CABLE control


FLOATING MAIN SHAFT RIDING ON BALL AND ROLLER BEARINGS
ALL TRANSVERSE STRAINS TAKEN BY HOUSING (SOLID RED), NOT BY SHAFT
ALL GEARS and BEARINGS SEALED IN OIL (RED TINT)
SPIRAL BEVEL GEAR AND PINION DRIVE
GREASE RESERVOIR FOR CABLE DRUM BUSHINGS
PLANETARY TRANSMISSION DRIVES CABLE DRUMS

. . . and plan to buy Buckeye

IT'S what is inside a tractor power control unit that makes the difference in job performance. Buckeye Power Control Units are built according to finest engineering practice. The entire mechanism runs in oil, sealed against leakage and dirt. Ball and roller bearings are used throughout. Spiral bevel gear drive provides quiet, smooth running. Big clutch and braking area with external bands and molded brake lining means cool operation, long life. Planetary transmission drive of cable drums provides positive control, smooth action. Full tractor power is transmitted from power take-off through adaptor to winch.

You'll get the most out of cable control when you buy Buckeye.

WITH BUCKEYE CABLE CONTROL YOUR TRACTORS CAN DO MORE JOBS!

LOOK AHEAD

BUY BONDS TODAY TO BUY BUCKEYES TOMORROW

BUCKEYE TRACTION DITCHER CO.
Findlay, Ohio

Trenchers
Tractor Equipment
Road Wideners

Buckeye

Convertible Shovels
Spreaders
Power Finegraders

NOT in the *Contract*

Two little negro boys were loitering on a street corner, when one said to the other: "How old is you?"

"Ah's five," was the reply. "How old is you?"

"Ah don' know," said the first.

"You don' know how old you is?"

"Nope."

"Does women botha' you?"

"Nope."

"Youse fo'."

You don't know, gasped the recruit on his first ocean voyage, where your next meal is going to!

Doctor: "You have acute appendicitis."

Wac: "Listen, sir, I came here to be examined, not admired."

Then there was the sailor who treated all his girls with wine. He wanted a little port in every sweetheart.

A Scotchman was told that his wife needed salt air—so he fanned her with a herring.

"You've been here two years and never complained," she said to her cat-skinner boarder. "What are you leaving for now?"

"I just found out you ain't got no bathtub."

"I'll bet you think twice before leaving that wife of yours alone in the evenings."

"I'll say! First I have to think up an excuse for going out, and then a reason why she can't come with me."

First G.I.: "Wish we had a fifth for bridge."

"Second G.I.: "You don't need a fifth for bridge, you dope."

First G.I.: "Well, make it a pint then."

Sidney: "What's this I hear about you going with one of these goody-goody girls?"

Sam: "You're right, every time I park the roadster she says, 'goody-goody'!"

"I sent for it, I'm going to start a victory garden!"

The big contractor had died and gone to—well, not to heaven. But hardly had he settled down for a nice long smoke, when a hearty hand slapped him on the back and into his ear boomed the voice of a persistent salesman who had pestered him much on earth.

"Well, Mr. Smith," chortled the salesman, "I'm here for the appointment."

"What appointment?"

"Why, don't you remember?" the salesman went on. "Every time I entered your office on earth you told me you'd see me here!"

"I ache all over."

"What's the trouble?"

"A couple of weeks ago we bought a lot of ultra modern furniture and I've just found out that all this time I've been sleeping in the bookcase."

A mine superintendent received the following note from a foreman:

"I am making out an accident report about Casey hitting his foot with a sledge hammer. Under 'remarks' do you want Casey's or mine?"

Selectee: "They can't make me fight."

Draft Board Chairman: "Maybe not, but they can take you where the fighting is, and you can use your own judgment."

Plumber: "Sorry, sir. I've forgotten my tools."

Professor: "That's all right, I've forgotten what I wanted you for."

Gal: "My goodness, that boy-friend of mine is trying at times."

Pal: "That's nothing, mine is trying at all times!"

Barber: "Will you have something on your face when I finish?"

Customer: "Well, if you don't mind, you may leave my nose there."

Ad in contemporary publication: Wanted—Caterpillar Model 7 or 8 or International Model TD-18 Tractor with bulldozer or bull grader and wench attachment.

He: "Let's get married or something."

She: "Let's get married or nothing."

An advertisement in an army camp paper: "Girl wants work in mess. Has been in one before."

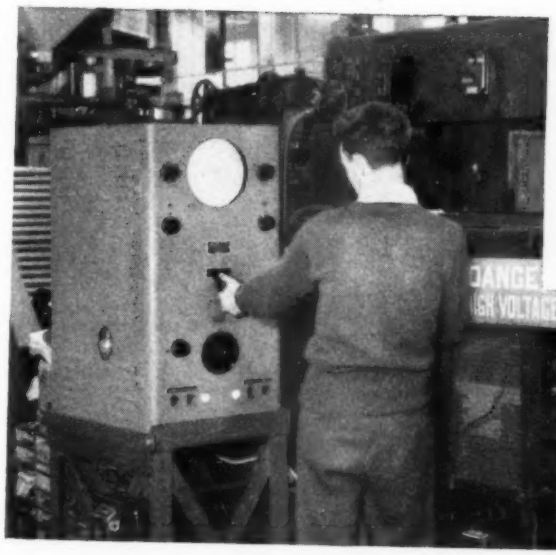
SHORTS STYMIED

Voltage surges which accompany switching and frequent starting and stopping of motors impose high dielectric stresses on the coil insulation, and can cause harmful short circuits. Yet this is an unavoidable condition of service for many motors.

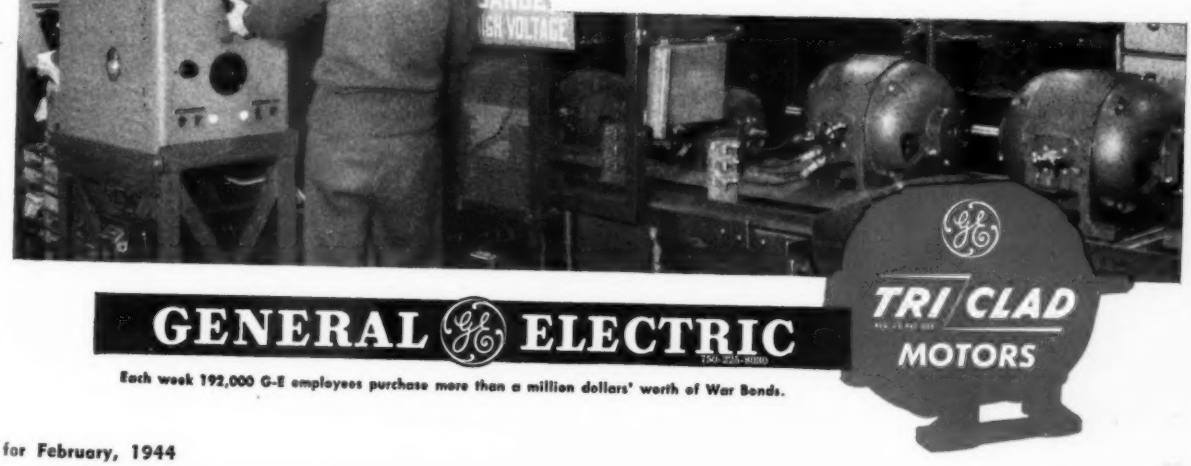
The grinder shown here, for example, starts and stops every time a finished part is removed and a new part inserted. But the two Tri-Clad motors that drive it have been built to withstand safely the voltage surges ordinarily encountered in this type of service. Their ability to "stymie" shorts was proved by *the new General Electric test* described below.

External grinder, equipped with two Tri-Clad motors, installed in the milk-machinery manufacturing plant of the Rite-Way Products Company, Chicago, Ill.

New high-potential, electronic surge-tester verifies strength of TRI CLAD motor windings



This electronic test of insulation makes a "cardiogram" of every Tri-Clad motor winding, ferreting out weaknesses that might lead to shorts caused by voltage surges in service. It tests each turn, coil, and phase group of the windings for adequate insulation strength to withstand the "steep front" high-voltage surges of actual service. First developed and applied by G.E., it's one of the production tests which all Tri-Clad motors must pass as they come off our production lines. – *General Electric Company, Schenectady, N. Y.*



GENERAL ELECTRIC

Each week 192,000 G-E employees purchase more than a million dollars' worth of War Bonds.

Equipment you ought to KNOW ABOUT

Plastic Precision Instruments

Manufacturer: The Emeloid Co., Arlington, N. J.

Claims: A non-metallic material which can be accurately fabricated for use in precision instruments that are light in weight, less costly than metal instruments and are accurate. Scientific instruments of every type, from slide rule to the most complicated artillery and navigation charting and calculating instruments are made of this new material, Emeloid.

Tiltdozer

Manufacturer: R. G. LeTourneau, Inc., Peoria, Ill.

Claims: Designed so its blade may be tilted a minimum of 12 inches on either side, or dropped parallel for straight bulldozing. The tiltdozer blade tilt is adjusted through a simple worm-gear-driven mechanism, manually operated by a crank, and equipped with a hand-set pin to hold the blade stationary. This newest LeTourneau dozer was designed especially for the Army Combat Engineers, but holds equal promise for construction, logging, mining, etc. It is particularly adapted to digging "V" ditches, making initial cuts and passes, and dislodging stumps and other obstacles. It operates with either the R4 or D4 "Caterpillar" tractor, and the LeTourneau Model T or Model HN Power Control Units.

For further details about the equipment on these pages please write to the manufacturer, mentioning Excavating Engineer.

Portable Generator

Manufacturer: Electrical Products Consolidated, Seattle, Washington.

Claims: This new air-cooled portable generator (EPCON B-30) is believed to be the most powerful of its size ever built. It is designed to meet wartime needs for portable power and light, delivers 3000 watts, 110-volt A.C., 60 cycle. Net weight is 305 pounds. Length, including base is 34 in.; height, 26 in.

Field ring is high-grade, annealed cast steel producing top electrical efficiency for given weight, and affords maximum support and stability to the generator. Cast iron fittings secure both the generator and the Briggs and Stratton engine to oak sled runners which serve as a strong but light base.

End bells are of open design like a wheel with spokes; dust covers are of light weight steel spinnings. The V-belt drive imparts a saving in weight over direct drive models, on which the generator must be solid enough to be held in the correct position for the direct driveshaft. Pulleys are of cast steel discs instead of solid metal.

Hydraulic Jacks

Manufacturer: Templeton, Kenly & Co., Chicago, Illinois.

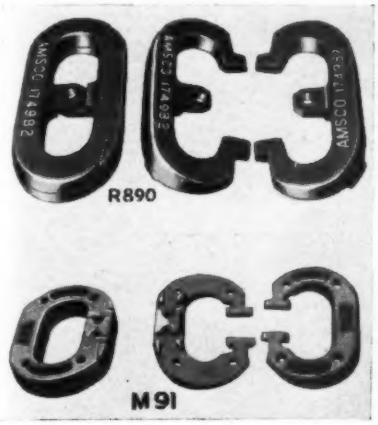
Claims: New tandem-pump Simplex 30-ton and 50-ton hydraulic jacks have high and low speed pumps. The pumps can be operated singly or in unison.

The base is made of special analysis solid steel bar stock which adds to the load-bearing security. The jacks have two release valves located on opposite sides of the base; either release screw controls ram return. Carrying grip is an integral part of the pump. Prior to the introduction of these jacks a 20-ton model was the largest manufactured by the company.

Model 30HJ—capacity 30 tons; low

height 11"; hydraulic lift 7"; weight 65 pounds.

Model 50HJ—capacity 50 tons; low height 12"; hydraulic lift 7"; weight 115 pounds.



Dragline Chain Repair Link

Manufacturer: American Manganese Steel Division of the American Brake Shoe Company, Chicago Heights, Illinois.

Claims: Clark replacement links, originally introduced by John O'Fallon Clark, permit quick repairs on the job to dragline bucket chains and insure a tightly held joint. Two types of links are made.

For larger chains, with from 1¼" to 2½" sections, having the longer pitch lengths, the "Clark" link (M-91) is recommended for repair use. The halves, with interlocking lugs, are secured by four rivets.

For smaller chains from ⅞" to 1⅛", the "J-C" (R-890), is more adaptable. Tapered ends fit into grooves in the opposing half link; the two halves are joined by a single rivet through the joined center lugs. Center bar or stud prevents kinking.

Both types are stocked for immediate shipment by the manufacturer.

Flood Lighting Unit

Manufacturer: Benjamin Electric Manufacturing Company, Des Plaines, Illinois.

Claims: The new type RDS floodlighting projector, replacing the Benjamin type RD projector, has a seamless steel housing and embodies all the features of the previous models with the exception that all parts formerly made of aluminum, brass or other nonferrous metals are now furnished in steel or cast-iron specially treated by porcelain enameling, and other rust-proofing to render them exceptionally resistant to corrosive atmospheric influences and weathering. Among the features are adjustability of the beam spread over the entire beam range from narrow to wide which makes it possible to fit the beam to the requirements of the installation; special focusing mechanism to permit placement of light exactly where needed without waste; easy installation; easy maintenance and quick acting, safety type cover clamps. The new RDS units are furnished in two models. The RDS 14 for 300 watt and 500 watt general service lamps or 500 watt floodlighting lamps. The RDS 18 for 750 watt and 1000 watt general service lamps or 1000 watt floodlighting lamps.

Respirator

Manufacturer: Mine Safety Appliances Company, Pittsburgh, Pa.

Claims: The aluminum model Dustfoe Respirator is now available in an all-plastic model, approved by the U. S. Bureau of Mines. Known as the Clear-Vue Model Dustfoe, it is an efficient, compact, lightweight respirator made of transparent plastic—durable, odorless, non-corrosive, and a non-conductor of electricity and heat. The transparent construction makes possible the inspection of the filter for proper insertion and seal without removal from the respirator.

Wire Rope

Wire Rope plays a vital part in the fighting power of every soldier. — Lt. Col. Roswell P. Rosengren

Demands (for Wire Rope) are increasing at a greater rate than production. — Steel

Let's Make It Last — to the Limit

Unless you give your wire rope a fair chance, it will not give you the full service of which it is actually capable. The following suggestions should be helpful.

1—Use wire rope for the correct size, construction, type and grade for the particular work to be done.

2—Keep your wire rope using equipment in good condition. Sheaves should be of proper size, design, material—and free from corrugations. Keep all sheaves and idlers properly lubricated and in line. Avoid excessive fleet angles.

3—Keep your wire ropes thoroughly and correctly lubricated.

4—Avoid kinks and sudden jerks; avoid cross-winding on drums, and reverse bends if possible.

5—Make sure your wire ropes operate with an adequate factor of safety. If there is not a proper ratio between the strength of the rope and the maximum load to be handled, the rope may be overstressed—a condition no rope can long survive.

6—Reels and coils of wire rope should not be dropped from truck when being unloaded . . . If rope is not put into service when received, see that it is stored in a place protected from weather and free from acid fumes.

Help speed the day of Victory by getting the utmost service from your wire rope.

A. LESCHEN & SONS ROPE CO.
WIRE ROPE MAKERS — ESTABLISHED 1857
5909 KENNERLY AVENUE — ST. LOUIS, MISSOURI, U. S. A.
NEW YORK • • • 90 West Street
CHICAGO • • 810 W. Washington Blvd.
DENVER • • • 1554 Wazee Street
SAN FRANCISCO • • 520 Fourth Street
PORTLAND • • 914 N. W. 14th Avenue
SEATTLE • • 3410 First Avenue South

New trade literature

Title: **"Cooling System: Cleaning, Flushing, Rust Prevention, Anti-freeze"**

Subject: A 34-page pamphlet prepared by the Society of Automotive Engineers proving the best thought of automotive engineers on the care of liquid cooling systems and liquids used in them. In simple terms, and with many illustrations, the seven sections of the pamphlet give detailed instruction on checks and tests for cooling liquid losses; on routine maintenance; the causes of overheating and overcooling; causes of corrosion and the prevention of rusting; factors leading to clogging of the cooling systems and ways to prevent it, and the characteristics of different types of anti-freeze and their use.

Where to Get: Office of Defense Transportation, Washington, D. C. (Free)

Title: **"Graco Lubrication Equipment Catalog"**

Subject: A new catalog describing Graco Lubricating equipment and featuring new lubrication items and a new price schedule. It describes Graco equipment now available for immediate delivery.

Where to Get: Gray Company, Inc., Minneapolis, Minnesota. (Free)

Title: **"MacQuown's Coal Directory"**

Subject: A four part, 784 page source of supply and trade directory of the coal and coke producing and selling companies. Data on all phases of the industry is covered, supplemented by maps showing mine locations.

Where to Get: National Coal Publications, Pittsburgh, Pa. Standard edition ($25.00), Abridged ($15.00).

Title: **"Manual on Portable Gas-Electric Generator Plants"**

Subject: A new 40-page engineering manual, containing information on portable gas-electric generator plants, includes explanation of power factor; load factor; mixed loads and power calculations. Well illustrated with photographs, drawings, diagrams, tables, construction views and specifications.

Where to Get: Department of Information, Master Vibrator Company, Dayton, Ohio. (Free)

Title: **"Wire Rope Buyers' Guide"**

Subject: Catalog and 60 pages of information on conservation and care of wire rope, containing tables and data in accord with the new simplified practice on wire rope.

Where to Get: Write on company letterhead to Jessel S. Whyte, President, Macwhyte Company, Kenosha, Wis. (Free)

Title: **"Lighting Handbook"**

Subject: Designed as a guide and reference book for lighting engineers, designers, architects and builders, this 175 page book has information on lighting terms and measurements, recommended levels of illumination, interior lighting design calculations, interior wiring for lighting, specific lighting applications in stores, offices, schools, public buildings, industrial plants, and architectural, aviation and street and highway lighting.

Where to Get: Westinghouse Lamp Division, Bloomfield, New Jersey. ($1.00)

Title: **"Margins of Mobility"**

Subject: Vital questions on wartime highway transportation and the problems we must face in the peace to come. Answers questions on: safe margin of mobility, outlook for new civilian tires, and plans that should be made now to meet postwar highway transport needs.

Where to Get: Automotive Safety Foundation, Tower Building, Washington, D. C. (Free)

Title: **"Payloader Tractor Shovels"**

Subject: This four-page folder describes the uses of the Payloader (1 cu. yd.) tractor shovel—Model HL. Uses include material handling or construction work at airports, army camps, ordnance plants, public utilities, municipalities, highways, etc.

Where to Get: The Frank G. Hough Co., Libertyville, Illinois. (Free)

Title: **"Safe Earthmoving"** (Film)

Subject: A sound film dedicated to safe practices in the operation of earthmoving machinery showing possible earthmoving equipment hazards, visualizing the "right" way. The entire picture is dedicated to the welfare of the man on the job, contractors and all others affiliated with construction. Running time is 13 minutes. It fits any projector accommodating a standard 35 mm. strip film and 16 in. record (33⅓ rpm.).

Where to Get: R. G. LeTourneau, Inc., Peoria, Illinois. (Loaned free)

Title: **"Right on the Nose"**

Subject: A booklet for safety and medical directors. Objective is to help prevent eye accidents to workers wearing improperly fitted safety goggles. Bearing the same title, a 16 mm. sound film on the same subject is available on free loan basis.

Where to Get: American Optical Company, Southbridge, Mass. (Free)

Bite? A Haiss Hi-Power will swallow our whole world in one grab
HAISS
DIGGING BUCKETS
are weight-proportioned to sink their husky teeth in—and power-reeved (up to 7:1) to dig down for a heaping payload at every grab. Ask any crane operator!
GEORGE HAISS MANUFACTURING CO., INC., 144th St. & Park Ave., New York 51, N.Y.

Bucket agencies throughout the country. Write, wire for prices, delivery and catalogs.

TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. If no change in copy is desired, three continuous insertions are offered for the price of two. Read these instructions carefully. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Count your own copy to save delay. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January issue closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

MISCELLANEOUS EQUIPT.

FOR SALE
1—Model K—A C Bulldozer
2—8-yd. Autocar Snub-nose dump trucks—12:00x24 tires (new)
1—6-yd. Chevrolet 9:00x20 tires (new)
1—8-yd. G M C truck 11:00x24 tires.
Box 3011

Ragland Roller, Farmall tractor with steel front wheels and sheepsfoot tamps built on 30" wide rear wheels. Appropriate fenders and lights and anti-overturn attachment. Machine passes North and South Carolina highway specifications.
Neal Hawkins, Gastonia, North Carolina.

FOR SALE
Two 2-yard, 1938 Jaeger Truck Mixers, mounted on 1938 Ford V-8 chassis. Both mixers and trucks are in A-1 condition.
Thomas DeFalco
14 May St. Worcester, Mass.

FOR RENT
(1) Lorain 75D, 1½-yd. gasoline shovel
(1) Lorain backhoe attachment for same with 36" or 42" bucket
(5) 7½ ton Sterling dump trucks
(1) International Diesel 35 to 40 bulldozer
Box 3010

FOR SALE
One 4-yard and one 5-yard Hendrix dragline buckets, light weights. Both in good condition. Located Arkansas. Box 3001

22½ ton McMyler-Interstate loco. crane
20 ton Brownhoist locomotive crane
1¼ yd. Lima shovel, crane & dragline
40 ton Vulcan saddle tank locomotive
16 ton Vulcan 36" gauge gas locomotive
5 ton Plymouth 36" gauge locomotive
No. 1 Vulcan hammer. Std. base
MACINTOSH ENGINEERING CO.
2907 Library Ave. SHadyside 4535
Cleveland 9, Ohio

SURPLUS ENGINES

All new—late models. Factory production changes give us these engines to offer for immediate shipment. Suitable for shovels, draglines, cranes, power units, etc. Offered "as is" only.

2—Waukesha Model WAL Gasoline Engine 6 Cyl. —5¾x6½—148 H.P. @ 1080 R.P.M. Idling —1013 cu. in. piston displacement.

1—Wisconsin Model M-4-A Gasoline Engine 6 Cyl.—5¼x6—117 H.P. @ 1230 R.P.M. Idling Speed 779 cu. in. piston displacement.

6—Buda Model 4 DT-226 Diesel Engine 4 Cyl.—3⅞x5½—37.5 H.P. @ 1410 R.P.M. Idling Speed 226.4 cu. in. piston displacement.

F.O.B. Erie, Pa.

Write for any further information desired and for prices and details concerning additional accessories available for SOME of the above engines.

Bucyrus-Erie Company Parts Department **South Milwaukee Wisconsin**

FOR SALE
1—1-yd. Byers Dragline Crane
1—⅜-yd. Insley Shovel
1—32 ft. Austin Western 13 in. bucket conveyor. Prophetstown Sand & Gravel Co., Prophetstown, Ill.

FOR SALE
Front end of Lima Crane, complete, boom, dipper sticks, dipper, drum laggings and cables. Has been but slightly used.
P. O. Box 801 Klamath Falls, Oregon

FOR SALE
1942 Anthony 3-yd. Hydraulic P.T.O. Dump bed.
E. D. Richardson & Sons Mfg. Co. Cawker City, Kansas

FOR SALE
2000 used Bower Roller Bearings No. BT 2686 complete with cup.
Morrison & Risman Co., Inc.
1437 Bailey Ave. Buffalo 12, N. Y.

1—1936 Model 150 P&H Shovel with Ford V-8 power, new style tractor-type treads, 12 ton—"as is" $4485.00

2—1941 General Motor Diesel powered Koehring Trail Dumps, 10 yd., Model TD-10, rebuilt and guaranteed each $8700.00

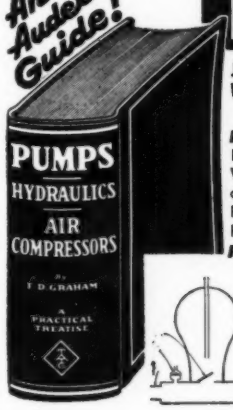
1—1941 Cletrac Model FD Diesel tractor with cable operated AMSCO Bulldozer, 95 drawbar h.p., 135 engine h.p., rebuilt and guaranteed. Price on application.

1—Austin-Western hydraulic Scraper, separate engine and hydraulic control. Good condition. Reasonable. Price on application.

HUNTER TRACTOR & MACHINERY CO.
327 South 16th St. Milwaukee 3, Wisc.

FOR SALE
Marion Type 352 gasoline shovel and dragline, mounted on crawler with 28" treads, and equipped with 21' boom, 15' 8" dipper handle, 1¼-yard dipper, 45' dragline boom and Page RH heavy duty 1¼-yard drag bucket, power boom hoist, and 1500 watt light plant. Recently overhauled and in good operating condition. Also including a quantity of spare parts. Located Minnesota. Box 3012

An Audel Guide!

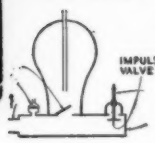


PUMPS-HYDRAULICS-AIR COMPRESSORS

JUST OUT! 3 BOOKS IN ONE—OVER 1650 PAGES, 1654 ILLUSTRATIONS, WITH QUESTIONS AND ANSWERS. COMPLETE PRACTICAL CONCISE INFORMATION FOR ALL ENGINEERS AND OPERATORS.

***PART 1*—PUMPS—850 Pages:** All types—Centrifugal—Rotary—Reciprocating Pumps: Their Theory, Construction, Operation and Calculations. Air and Vacuum Chambers—Power Pumps—Air Pumps—Jet Condensers—Surface Condensers—Condenser Auxiliaries—Condenser Operation—Calculations—Cooling Ponds—Cooling Towers—Water Supply—Hydraulic Rams—Special Service Pumps—Automotive Fire Pumps—Dredges—Codes. 942 Illustrations.

***PART 2*—HYDRAULICS—320 Pages:** Hydraulic Physics—Drives—Machine Control—Accumulators—Elevators—Hydraulic Airplane Control—Automobile Brakes—Shock Absorbers—Presses—Turbines. Many new uses explained. 310 Illustrations.



***PART 3*—AIR COMPRESSORS—406 Pages:** Compression of Air—Compressor Classification—Parts, Types—Inter and After Coolers—Regulating Devices—Installation—Lubrication—Operation—Maintenance—Blowers—Super-Chargers—Pneumatic Hand Tools—Ready Reference Index and Tables. 402 Illustrations.

Free Examination

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$4 COMPLETE PAY ONLY $1 A MO.

AUDEL, Publishers, 49 West 23 St., New York 10, N.Y.
Send postpaid AUDELS PUMPS, HYDRAULICS, AIR COMPRESSORS ($4). If I decide to keep it, I will send you $1 within 7 days; then remit $1 monthly until purchase price of $4 is paid. Otherwise, I will return it promptly.

Name.....
Address.....
Occupation.....
Employed by..... EE

FOR SALE

Vulcan 17-ton locomotive, steam, 36" gauge.
Porter 18-ton locomotive, steam, 36" gauge.
Davenport 19-ton locos., steam, 36" ga., (2).
(Above saddletank 10"x16" locomotives 100% rebuilt, tested, and refinished.)
Plymouth 25-ton gas locomotive, std. ga.
Industrial railway outfit, 2000', 14 cars, two 7-ton gas locomotives, all 24" ga.
Fruehauf 60-ton carryall trailer, solids, A-1.
Bucyrus-Erie 1¼-yd. gas-air crawler shovel.
Worthington 5'x40' rotary dryer, direct.
Pioneer 300W portable gravel washing plant.
Gyratory crushers: 27", 21", 16", 12", & 10".
Newhouse 7" reduction crushers, a.c., (2).
Merriman asphalt plant, r.r. type, 30 tons hr.
Euclid 6-yd. bottom dump crawler wagons (8).
2—Hook blocks, single, 20 and 12 ton.
Boiler tubes, 236—1¾"x5'; ferrules; (new).

H. Y. SMITH CO.
828 N. Broadway Milwaukee 2, Wis.

FOR SALE

Shovel attachment complete for Bucyrus-Erie 37-B 1½ yd. machine. Excellent condition. Dipper just equipped with new Amsco dipper body. Contact Brandeis Machinery & Supply Co., Brook & Warnock Sts., Louisville, Ky.

FOR SALE

4 yd. Electric Cat. Quarry Shovel.
1½ yd. Electric Cat. Crane-Dragline.
Shovels—¾—1—1¼ yd. Gas.; 1½ yd. Elec. Diesel Dragline on Trucks. 90' Boom.
Drag Scraper Outfits, ¾—1—1½—2—3—4 yd.
75 Ton Switcher Loco.; 42 ton geared.
30 Ton std. gauge Gas Locomotive, reblt.
Symons 4' Cone Crusher; 7½ K Gates, etc.
Fairleads for L-B K-55; 20 hp. gas motor.
Shovel & Crane attachments for P&H 206.
¾ yd. good rehandling Clam. Bucket. $250.
Jas. Wood, 53 W. Jackson, Chicago 4, Ill.

Wiley Whirley Model 75, 440-volt, 3 phase, 60 cycle; 75' boom; now equipped for dragline operation with 1½ yd. bucket. Rail mounted; 11' gauge. Rated approximately 20 tons at 12'. Located northern Michigan. Box 3002

CLAMSHELL BOOMS

Two booms for Bucyrus-Erie 43-B or 44-B machines available as surplus equipment of New York City contractor. No tagline equipment. In good condition. Box 3004

FOR SALE

Partial clamshell equipment for 30-B machine consisting of an auxiliary drum unit complete with hand ram and operating levers.
Box 3000

FOR RENT

1 yd. Bucyrus-Erie 32-B
1¼ yd. Lorain 69
6 Sterling 5-yd. dump trucks (good condition) —one diesel powered

393 Brookline Street
Newton Center, Mass. Tel. LASell 4300

FOR SALE

One Universal Lorain 10-ton 4-wheel trailer in very good condition; 2 new tires and 6 really good tires. Also one Fordson 5-ton 3-wheel roller. Earl Dennis, 8810 Tobey Ave., Affton 23, Mo.

BUCYRUS-MONIGHAN 2T Walker—Bucyrus-Erie 37B Gas—Bucyrus-Erie 30B Steam. Location northwest. Box 2969

Class 14 Steam Dragline centrally located, reasonably priced. Box 2999

Electrically Operated

175-B Ward-Leonard electric shovel with 65' boom, 42' handle. Can handle 4 or 5 yard dipper for stripping or 7 yard dipper if used for coal loading. Operated one-third of time loading coal since shipment. Excellent condition. Can be demonstrated. Reasonably priced. Ready for immediate delivery. Box 3013

WANTED

WANTED

Good used B-10 shovel preferably with crane attachment. J. C. Campbell Co., 413 W. Mich. St., Duluth, Minn.

Two "Caterpillar" DW-10 tractors and W-10 wagons or Euclids of approx. same capacity. Must be A-1 condition and late models. J. L. Shiely Co., Inc., 1101 N. Snelling Ave., St. Paul, Minn.

WANTED

6 to 12 yd. cap. stripper shovel or walker dragline.

R. C. STANHOPE, INC.
60 E. 42nd St.
New York 17, N. Y.

WANTED

Shovels—¾ to 2½ yards.
Draglines—1½ to 6 yards.

Frank Swabb Equipment Co., Hazleton, Pa.
Telephone: 3906

WANTED

Gravel Crushing and Screening Plant or Gravel Crushing and Washing Plant complete, Capacity 50 to 100 tons per hour; also ½ or ¾ yard Late Model Shovel. Box 3014

POSITIONS WANTED

Address all box numbers c/o EXCAVATING ENGINEER South Milwaukee, Wis.

DRAGLINE-SHOVEL OPERATOR

Thirty-one years old; 4-F Selective Service classification. Interested in operating machines in foreign country. Now located Indiana. Box 9219

ALL-ROUND OPERATOR

Twenty years experience on heavy equipment including operation, repair, overhauling and rebuilding of cranes, shovels and draglines, all makes, gas and diesel. Now employed temporarily as Master Mechanic advisor. Age 38; Selective Service classification 3-AH. Interested in permanent position. Located Ohio. Box 9220

SHOVEL-DRAGLINE OPERATOR

Six years' experience on Lorain, Marion and Koehring one- and two-yard shovels and draglines. Age 30; married; 4 children school age. Wants steady work anywhere in U. S. References. Can handle ordinary repairs. Available immediately. Located Wisconsin. Box 9223

CRANE OPERATOR

Twenty years' experience on Northwest, Speedcrane and P&H cranes. Also has operated coal yard bridges and towers. Age 37; Selective Service Classification 2-B. Married; 2 children. Can make own repairs. Wants job in permanent location. Willing to go anywhere. References. Now located Wisconsin. Box 9222

EXPERIENCED OPERATOR

29 years experience—over draft age. Operated about every make and type shovel, dragline (up to 5 yds. capacity), crane, back hoe, steel erecting, wood & concrete pile driving, steam-gas-diesel. Can make own repairs. Furnish references. Prefers heavy const. work like steel setting, or heavy crane work. Available immediately for work anywhere. Located Wisconsin. Box 9224

Notes from the manufacturers

Koehring Company of Milwaukee, Wis., announces the following sales manager appointments made at recent regional sales meetings with subsidiary companies: J. R. Steelman, Vice-President of Koehring Company, all companies; George J. Dimond, Koehring; A. E. Kelbe, Kwik-Mix; H. J. Holdsworth, Parsons, and J. F. Robbins, Johnson sales.

Koehring Company, Milwaukee, Wis., announces the award of the Army-Navy "E" on December 12.

Iowa Manufacturing Company of Cedar Rapids, Iowa, announces that a 25-cu. yd. rock crushing and screening plant, a memorial to a fellow worker, Louis M. Parks, missing in action since January 28, 1943, was built on donated time by their 1,000 employees. Completed in eight hours, the memorial was presented to the government as a 100% gift for use by the army in some foreign theater of operations.

The Timken Roller Bearing Company of Canton, Ohio, announces that Ralph L. Wilson, former chief of the Metallurgical and Conservation Branch, Steel Division, of the WPB at Washington, D. C., became chief metallurgical engineer of the firm Jan. 1.

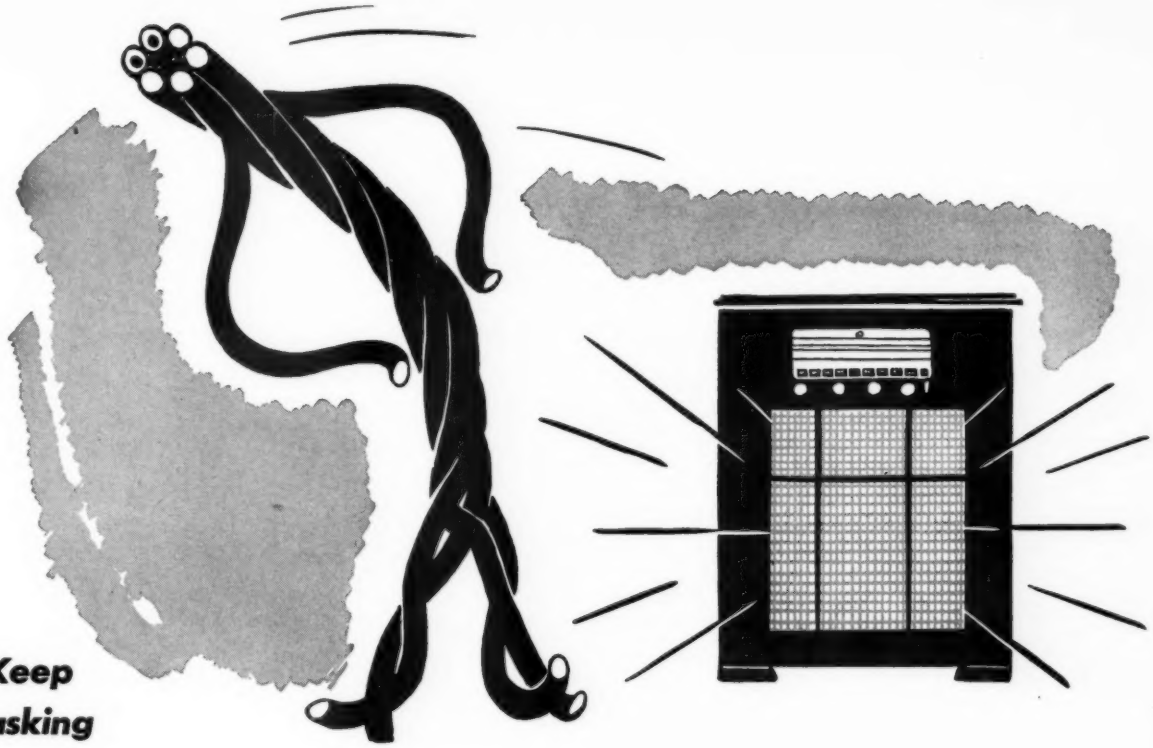
R. G. LeTourneau, Inc., of Peoria, Ill., announces that Howard L. Stilley has been promoted to chief field engineer to succeed Ken F. Park, who resigned to join the Caterpillar Tractor Company.

Westinghouse Electric and Manufacturing Company of East Pittsburgh, Pa., announces that James H. Jewell has been appointed assistant manager of Industry Departments. He will continue to head the company's Agency and Specialties Department.

Plants owned or operated by Westinghouse, for the Navy's Bureau of Ordnance and the U. S. Maritime Commission, produced a monthly quota of over $70,000,000 in 1943.

Manufacturing operations were established in DuBois, Pa., Jan. 1. This unit manufactures products in which rubber and textiles are employed. A. J. Baker, manager of Akron factory equipment, is plant manager.

International Harvester Company, Chicago 1, Ill., announces the creation of a separate motor truck division to have entire control of design, production and distribution of International trucks. P. V. Moulder, former assistant to the second vice-president, has been appointed general manager of the new division.



Keep asking for

AMERICAN CABLE TRU·LAY PREFORMED WIRE ROPE

● When a wire rope runs around a drum or sheave its wires flex and bend. This is grueling work for a non-preformed rope because of the internal stresses forcible twisting sets up in the wires. But the preforming process relieves TRU-LAY of such stresses and endows it with truly remarkable resistance to bending fatigue.

Because . . .
it resists bending fatigue!

No wonder the Armed Forces take so much of our production!

This is just *one* of the advantages built into American Cable TRU-LAY Preformed —at the mill. Just *one* of the reasons why TRU-LAY Preformed wire rope is preferred by so many operators. Specify it for your next line. It will steady your machine production; save you time and prevent accidents.

AMERICAN CABLE DIVISION

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma

AMERICAN CHAIN & CABLE COMPANY, INC.

BRIDGEPORT · CONNECTICUT

ESSENTIAL PRODUCTS . . . TRU-LAY Aircraft, Automotive, and Industrial Controls, TRU-LOC Aircraft Terminals, AMERICAN CABLE Wire Rope, TRU-STOP Brakes, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Castings, CAMPBELL Cutting Machines, FORD Hoists, Trolleys, HAZARD Wire Rope, Yacht Rigging, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses . . . *In Business for Your Safety*

Ready Now!

NEW 1944 CATALOG and

WIRE ROPE BUYERS' GUIDE

Replaces ALL other catalogs

Changes in wire rope strengths, sizes, grades makes this new catalog a necessity to anyone specifying, using, and buying wire rope.

Information contained in the new 1944 Guide will save you delay in purchasing of wire rope, as well as help you conserve (through proper maintenance) your present wire rope.

Designed, Written for Wire Rope Users

Every wire rope user who *needs* a catalog for reference should have *this* one. It will help you on the job. This is no ordinary manufacturer's catalog. It is designed and written for the wire rope consumer.

Ask for your copy of Catalog G-15

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